FLIR Sensors Manager

Software to manage and control FLIR Systems thermal imaging cameras for security and surveillance applications

User manual

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FLIR Sensors Manager User Manual

Document Code:	MAN-IT-2008-003
Revision:	2.0
Date:	January 2010
Internal Code:	MT1003/2008v2.0

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1 Introduction

This manual will familiarize a user with the FLIR Sensors Manager (FSM) application, taking the user through the most common operational steps. This document is based on a specific layout of FSM, and may differ from the actual application, but the components and operating steps are the same.

2 Nexus Overview

Nexus is a **"plug- and- play"** middleware tool allowing management of a wide variety of sensors; from very basic sensors to complex, networked imaging integrated systems, including radars, DVRs, I/O sensors, ground sensors, etc. The Nexus system is built over three main entities:

- **Server**: the Server is connected to the devices, turning them into network plug-and-play devices.
- **Client**: the Client is the user interface for interacting in a network of sensors; it could be FSM or a Nexus SDK-based application.
- **Development Tools:** the Development Tools are a group of software components that allow developers to easily code custom applications to manage and control the sensor network. These include the following:
    - **Map**: the Map control provides functions to build a graphical geographic representation of the network.
    - **Software Development Kit**: the SDK provides a library including a set of functions to control the servers and get their current status.
    - **Video Player**: the Video Player provides functions to play video from different sources and to perform image post-processing and video analysis for surveillance.

3 FLIR Sensor Manager Licenses

Certain FSM features will require a license to be active. The available licenses and the features enabled are described below:

- **Demo Licens**e**:** When no license is loaded, the program runs in Demo Mode, allowing command and control of one sensor at a time and one video per video wall.
- **Basic License:** enables managing of up to 4 sensors and the geo-mapping features.
- **Pro License**: enables all the features:
    - Up to 4 sensors.
    - Geo-mapping.
    - Surveillance Monitor.
    - Image Post Processing.
    - Radar cueing and tracks display.
    - Video wall display.
- **Additional Sensor License:** allows increasing the number of sensors that can be managed simultaneously (up to 50 per workstation).

4 FLIR Sensors Manager Installation

To begin the installation process, choose Windows (XP or newer) PC or laptop based on the following requirements.

Minimum Hardware Requirements:

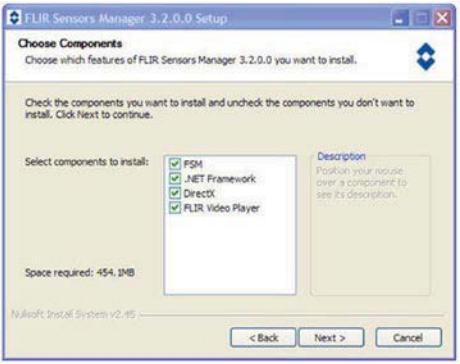
Intel Pentium Processor IV 3G or higher
1 GB RAM
2 GB Free hard drive space available
VGA Graphics Adapter with:
Minimum 1024x768 resolution
128 MB dedicated video memory*
Window DirectX Compatible
Real Time Video Overlay rendering capabilities

*Incompatibilities detected with certain onboard Intel® Extreme Graphics chipsets.

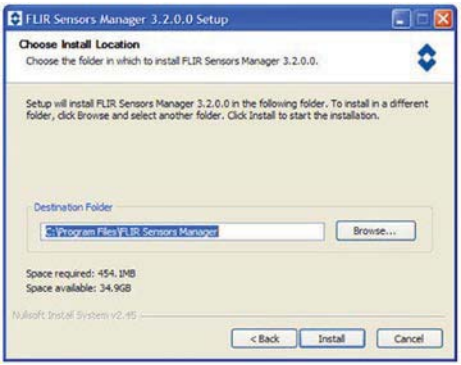
1. Insert the Installation CD and double click on the FSM Setup icon. The Installation Setup window will open, click **Next** to continue.

FLIR Sensors Manager 3.2.0.0 Setup
Welcome to the FLIR Sensors Manager 3.2.0.0 Setup Wizard
This wizard will guide you through the installation of FLIR Sensors Manager 3.2.0.0.
It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.
Click Next to continue.
Next >
Cancel

2. Read the License Agreement and click **I Agree** to continue. In the next screen select the components to be installed. Please note that **FSM will not work if any of the components are not installed.** Unselecting components from the installation process is not recommended.


FLIR Sensors Manager 3.2.0.0 Setup
Choose Components
Choose which features of FLIR Sensors Manager 3.2.0.0 you want to install.
Check the components you want to install and uncheck the components you don't want to install. Click Next to continue.
Select components to install:
FSM
.NET Framework
DirectX
FLIR Video Player
Description
Position your mouse over a component to see its description.
Space required: 454.1MB
Nullsoft Install System v2.45
< Back
Next >
Cancel

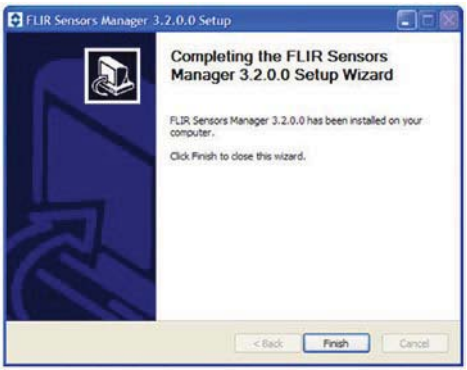
3. When asked to choose the install location, click **Install** to accept the default location. If a different location is desired, click **Browse** to navigate to the location, then click **Install**.


FLIR Sensors Manager 3.2.0.0 Setup
Choose Install Location
Choose the folder in which to install FLIR Sensors Manager 3.2.0.0.
Setup will install FLIR Sensors Manager 3.2.0.0 in the following folder. To install in a different folder, click Browse and select another folder. Click Install to start the installation.
Destination Folder
C:\Program Files\FLIR Sensors Manager
Browse...
Space required: 454.1MB
Space available: 34.9GB
Nullsoft Install System v2.45
< Back
Install
Cancel

4. The last component to be installed is the FLIR Video Player. Please note that the FSM application relies on this player and it will not function without it.

FLIR Video Player 2.4.8.5 Setup
Completing the FLIR Video Player 2.4.8.5 Setup Wizard
FLIR Video Player 2.4.8.5 has been installed on your computer.
Click Finish to close this wizard.
< Back
Finish
Cancel

5. Click **Next**, read and accept the License Agreement and click **Next** again.


FLIR Sensors Manager 3.2.0.0 Setup
Completing the FLIR Sensors Manager 3.2.0.0 Setup Wizard
FLIR Sensors Manager 3.2.0.0 has been installed on your computer.
Click Finish to close this wizard.
< Back
Finish
Cancel

6. When the installation is complete, click **Finish** to close the installer.

5 FSM Operation

FLIR Sensors Manager offers a user friendly and straight forward interface that focuses on usability and situational awareness. While minimizing operator workload, FSM still allows for full control of its complete suite of surveillance and video management capabilities. FSM enables a user to control anything from a single sensor to a complete security network that includes infrared and daylight cameras, radars, NDVRs, and ground sensors. FSM is the single point solution for control of security sensors.

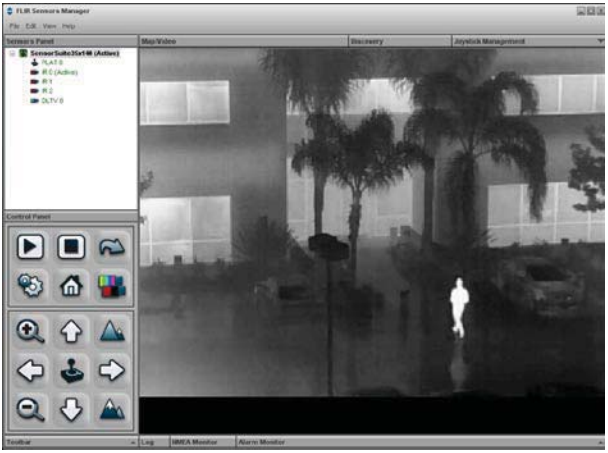
5.1 Sensor Network Configuration

In order to talk to a sensor, the user will need to make sure their PC, or client host, is on the same network as the sensor. This is typically as simple as changing the client PC's IP Address to be on the same subnet as the sensor and connecting them together in a physical network.

Please see Appendix A for details on how to configure a network of sensors.

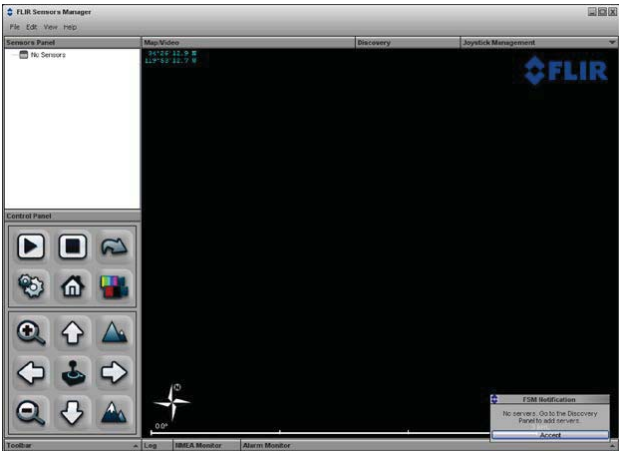
5.2 Server Discovery

When FSM is run for the first time and a single sensor is connected in the network, the screen will look like this:



When opened for the first time, FSM will automatically discover the sensor, connect and open the streaming IR video into Video Wall 0. Refer to the next section, Application Preferences, to customize these settings.

If there are no sensors or more than one sensor available on the network, FSM will appear with a black background as shown here:



A **FSM Notification** displays in the lower right-hand corner of the screen, indicating there are multiple sensors or no sensors on the network. Open the Discovery Panel to continue.

The Discovery Panel provides the functionality of adding servers to the Active Servers list. Click on "Discovery" to open or close this panel. Servers can be added manually by entering the IP address and port of the server and clicking on the "**Add**" button, or by performing a Network Server Discovery. When the "**Refresh**" button is clicked, FSM will search the network for available servers and list them under "Discovered Servers". These servers can be added to the Active Servers list by clicking the ">" button.

Once the servers are on the Active Servers list, they will be displayed in the Sensors Panel:

5.3 Application Preferences

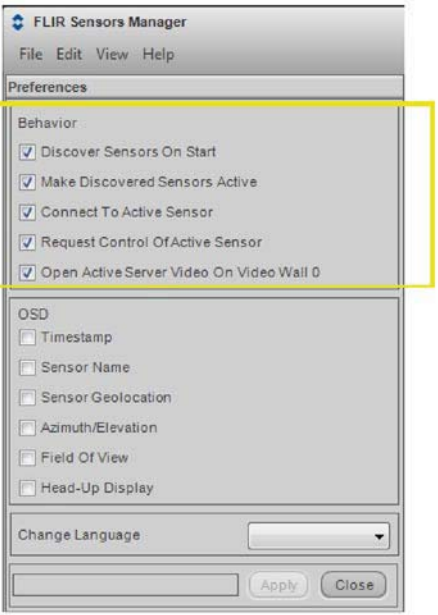
For ease of operation, FSM is designed to discover, connect, gain control, and open a video into a video wall by simply plugging in the server to the network and starting FSM. This is very convenient if the user is running a "one sensor, one user" environment, but if the user runs multiple sensors and works in a multi-user environment it is best practice to disable (deselect) the automated features. In order to disable the automated features of FSM, go to the application preferences panel by clicking on the "**Edit**" button on the menu bar and selecting "**Preferences**".

In order to save any changes made in the preferences, the user must click the "**Apply**" button.

The "**Behavior**" section changes the actions that will be performed upon application start up.

- The "**Discover Sensors On Start**" feature will automatically discover sensors on the network.
- The "**Make Discovered Sensors Active**" feature will take a single discovered server and add it to the active servers list. If a client is on a network with multiple servers, the user will have to manually add the server to the active servers list.
- The "**Connect To Active Sensor**" feature automatically connects to the active sensor in the sensor's panel.
- The "**Request Control Of Active Sensor**" feature automatically requests control over the connected active server.
- The "**Open Active Server Video On Video Wall 0**" feature will open a single video from the connected active server.

Note: If the server controls multiple camera sensors, only the first video source from the infrared camera will be opened in the video wall.



The "**OSD**" section allows setting the default OSD settings for the video windows when the user creates a new video window inside of a video wall.

The "**Change Language**" section allows setting the application's language. The changes will take effect after restarting the application.

5.4 Server Status and Basic Management

Everything needed for basic sensor management is on the left side of the main window: the Sensors Panel and the Control Panel.

5.4.1 Sensors Panel

The Sensors Panel provides a view of the servers' status and allows performing several management operations.

A connection with a server can be established by right-clicking on the server name:

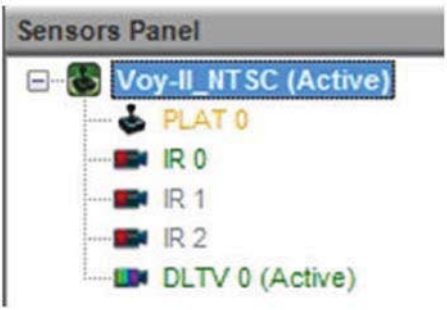
Once connected, the status of a server and of its devices is displayed.

Server Status:

- A green box next to the server name indicates that the client is connected.
- A green box with joystick next to the server name indicates that the client is connected and has control.
- A red box next to the server name indicates that the client tired to connect to the sensor but the connection could not be achieved.
- A grey box next to the server name indicates that the server is not connected to the client.

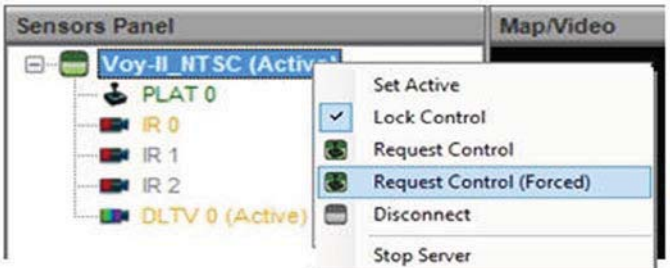
Device Status:

- Green indicates a device is communicating.
- Yellow indicates a communication packet has been sent and is awaiting a response.
- Red indicates that the device has not responded for a defined time parameter and is probably either disconnected or not configured correctly.

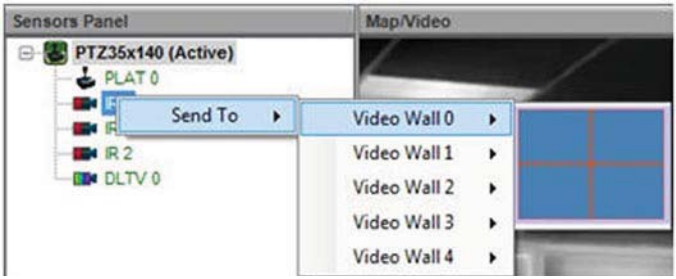


To **Request Control** of a server and make active, double click on the selected sever name. A joystick next to the server name indicates control has been obtained, as shown above.

The control of a connected server can also be requested by right-clicking on its name and selecting the **Request Control** option. A client may Lock Control over the server by right-clicking and selecting **Lock Control**. This allows the user to automatically deny requests for control from other clients. In some situations the user may need to use **Request Control (Forced)**, which is a request for control that cannot be denied even by clients with Lock Control selected. A forced request is a request to control a server even if locked. However, the client using the server can still deny the requesting client control.



Right-clicking over a DLTV or an IR sensor displays the "**Send to**" menu which allows opening the sensor's video on one of the application's video walls:



Please note that double-clicking on the sensor requests control over that sensor and sets it as the active sensor as seen in the picture below. The active sensor is the sensor currently being controlled by the client.

Placing the mouse pointer over the sensor displays a tooltip with information on the sensor:

The information displayed contains the name of the server, the host identifier, its geo-location coordinates, and the status of the server (**Stopped**, **Running** or **Unknown**).

Right clicking on the sensor brings up a context menu that also allows user to set the server as the active server, disconnect from the server, or even Stop/Start the server.

NOTE: Stopping the server is not recommended for normal users. Stopping the server will disable command & control and digital video of the sensor over the entire network to all clients.

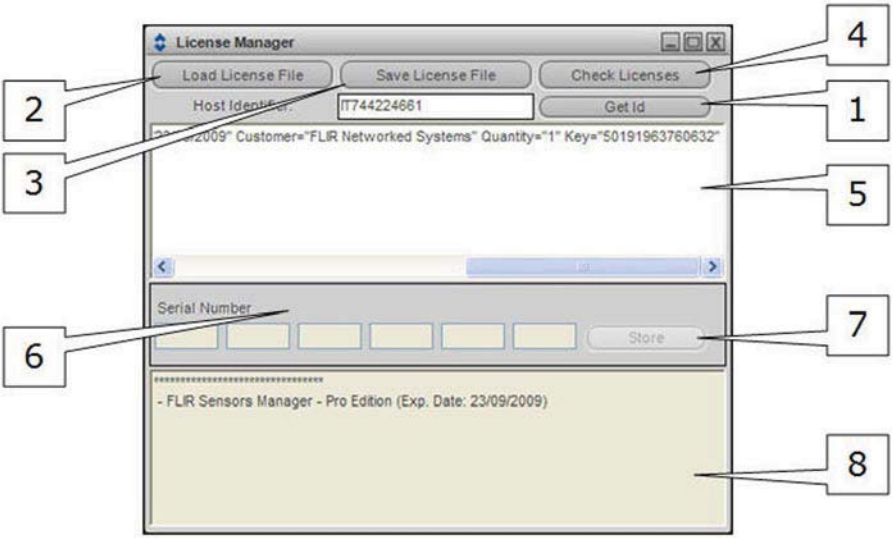
5.4.2 Control Panel

The control panel allows the user to perform most common sensor commands:

1. Scan List Start.
2. Scan List Stop.
3. Go To Preset.
4. Initialize Pan and Tilt.
5. Go To / Set (hold for 3 sec) Home Position.
6. Toggle Active Camera.
7. Zoom In.
8. Tilt Up.
9. Focus Far.
10. Pan Left.
11. Show Virtual Joystick (Pad).
12. Pan Right.
13. Zoom Out.
14. Tilt Down.
15. Focus Near.

5.5 Licenses Management

The licenses management module allows for setting and checking the application licenses. The License Manager can be displayed by clicking on the "**View**" menu button and selecting the "**License Manager**":



1. **Get Id**: displays the host identifier needed to generate a license string.
2. **Load License File**: loads a text file into the licenses text box.
3. **Save License File**: saves the contents of the licenses text box to the license file.
4. **Check Licenses**: checks the available licenses and displays the results in the licenses check text box.
5. The licenses text box displays the current license string.
6. The dongle data fields display the current dongle data. If no dongle is plugged in, these will be disabled.
7. **Store**: stores the data in the dongle data fields in the dongle.
8. The licenses check text box displays the result of the licenses check.

5.5.1. Upgrading Text Licenses

In order to upgrade the text license, the license string (typically a "license.txt" file) must be copied and pasted into the licenses text box (item number 5) and saved by clicking on the "**Save License File**" button.

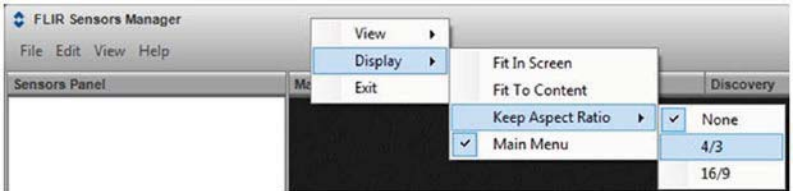
5.5.2 Upgrading Licenses in a USB Dongle

In order to upgrade a USB dongle with additional licenses, the license key (text string containing six groups of numeric characters) must be typed in the dongle data fields (item number 6) and stored in the dongle by clicking on the "**Store**" button.

Note: Permanent license strings can be attained by contacting a FLIR Applications Representative

5.6 Windows Options

Right-clicking on any window's title bar and selecting Display, will open a context menu to change window settings:



The **Fit** options will resize the window to fit either its content or the screen.

The **Aspect Ratio** options ensure that the selected aspect ratio will be kept after a resize.

The **Main Menu** toggling option is available only for the main window and it shows or hides the main menu.

5.6.1. "Always on Top" Window

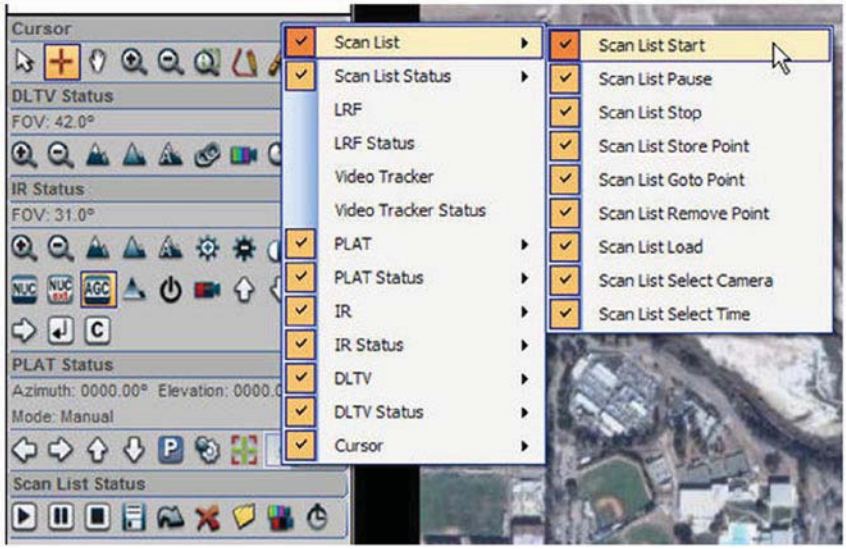
If the users want to keep one particular window always visible, they can use the **Always on Top** option. To do so, right-click on the window frame and select **Always on Top**:

5.7 Toolbar

The toolbar includes sections to control the sensors attached to a server. It will also display status data and allow for managing the different sensor features. To open the toolbar click on "Toolbar" in the lower left hand corner of the FSM main window.

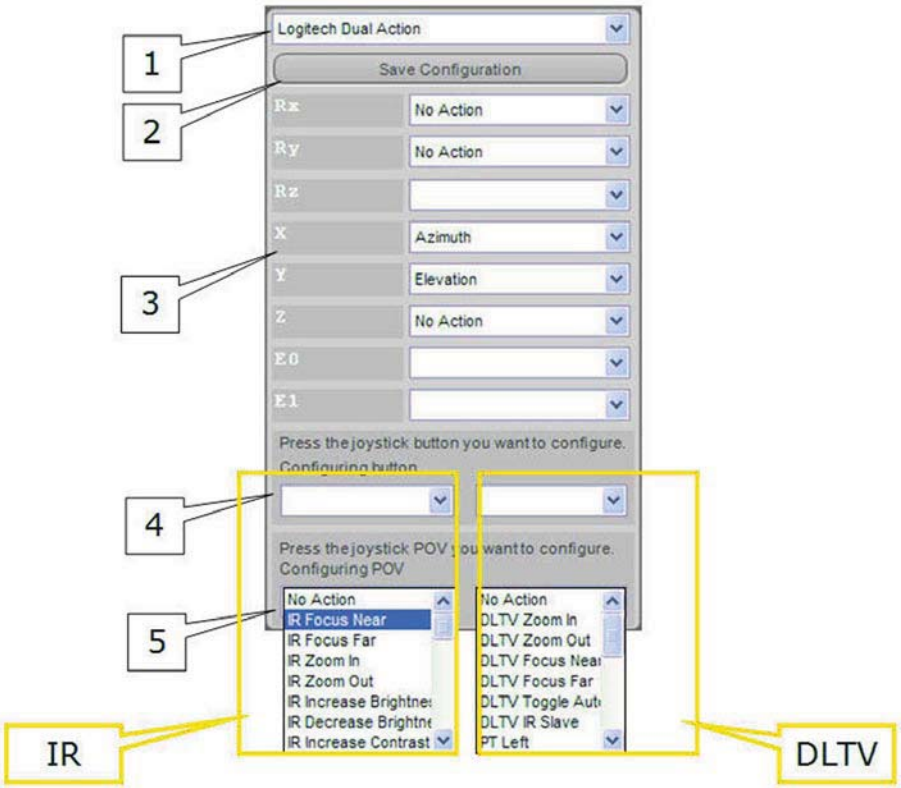
Note: To return to the Control Panel simply click "Toolbar" again.

To display different sections, add/remove control buttons, or display different status, right-click inside of the toolbar and select the appropriate checkboxes.



5.8 Joystick Setup

The joystick management module allows users to configure their joystick. In order to view the joystick it must first be plugged into the PC.



1. **Joystick selection drop down list**: selects the joystick to be configured.
2. **Save configuration button**: stores the current configuration, making it active for the rest of the application.
3. **Axes configuration drop down list**: set the axes actions. Axes can be tested using the graphic bars beside the drop down list.
4. **Button configuration drop down list:** sets the buttons' actions, allowing setting different actions when the active camera is a DLTV and when the active camera is an IR.
5. **POV configuration drop down list:** sets the POVs' actions, allowing setting different actions when the active camera is a DLTV and when the active camera is an IR.

Note: POV (Point of View) is not available on all joysticks

NOTE: Many commands in FSM are camera specific. Each camera operates independently from the other. The left column represents the command sent when the IR camera is the active camera. The right column represents the command sent when the DLTV camera is the active camera.5.9

5.9 FLIR Sensor Manager Map

FSM allows a user to display the sensors' locations on a geo-referenced map. To display the map, click on "Map/Video" in FSM's main window. This toggles FSM's main window between the Map and Video Wall 0.

5.9.1 Map Loading and Calibration

The map control provides the features of a Geographic Information System (GIS), combined with the management of sensors available on the network's:

5.9.2. Map Basic Controls

The map control can be managed via the keyboard or by using the computer mouse:

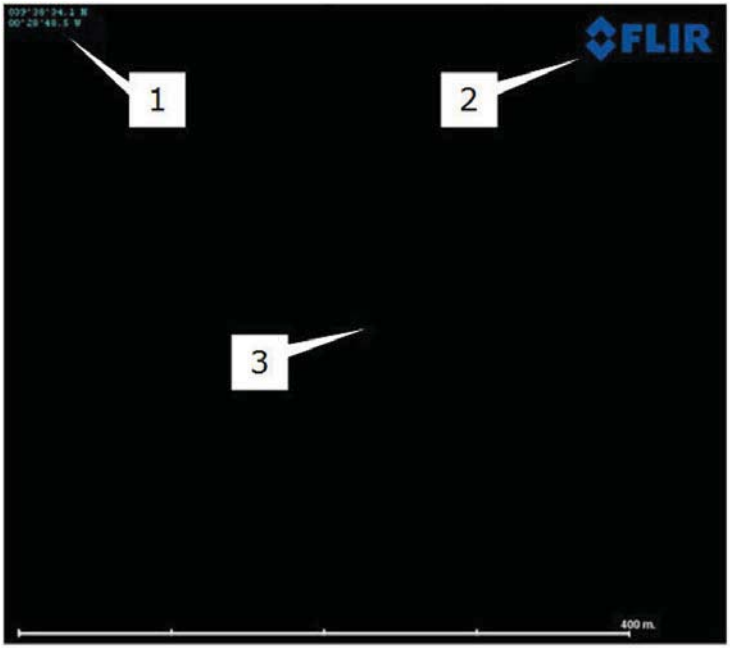
- **Left button click**: The cursor mode can be changed through the Toolbar or through keyboard shortcuts. A left button click effects depend on the selected mode
  - **None**: no effect.
  - **Aim**: allows a pan tilt system to pan and tilt toward the location clicked on in the map. This feature is applicable to only certain sensor types.
  - **Pan**: allows map panning.
  - **Zoom In**: zooms in the map view.
  - **Zoom Out**: zooms out the map view.
  - **Zoom Box**: allows zooming to a specified area. The area is defined by clicking then dragging in the map.
  - **Edit Area**: allows the user to draw alarm, detection, and exclusion areas when the active sensor is a radar.
  - **Ruler**: displays the distance between the selected points or objects. One of the ends is set by left-clicking on the map surface and the other is set by holding the "Shift" key while left-clicking.
- **Mouse wheel**: zoom in and zoom out.
- **Right button click**: show context menu.

MAP KEYBOARD SHORTCUTS

A	Arrow cursor mode (no action)
H	Hand cursor mode (pan)
R	Reticule cursor mode (aim)
Z/Shift+Z	zoom in/out cursor mode
Mouse wheel	Zoom in/out
Ctrl+mouse wheel	Pan horizontally
Shift+mouse wheel	Pan vertically
Alt+Mouse Wheel Ctrl+R	Map Rotation right
Alt+Mouse Wheel Ctrl+Shift+R	Map Rotation left
Crtl+N	Reset Rotation
B /Shift+B	Map Opacity (increase/decrease)

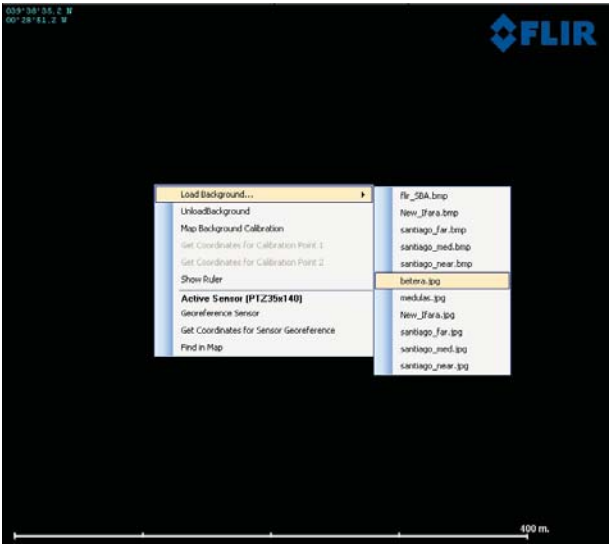
5.9.3 Map Load

When no map has been loaded into FSM, the map module will appear black:



1. **Geographic coordinates**: geographic coordinates of the point under the mouse position.
2. **Logo**: FLIR logo
3. **Map surface**: surface where the map will be displayed when loaded.

To load a map, right-click on the map surface and select the map file in the "**Load Background**" menu:



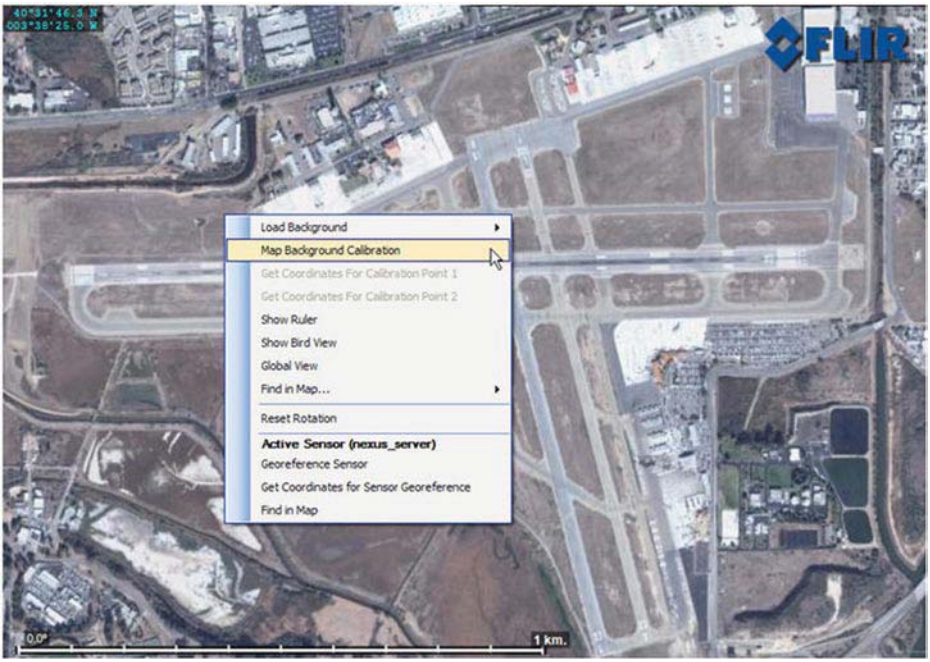
NOTE: In order to effectively calibrate a map, the image files used must be North-up and orthonormal. All map files must be placed in the maps folder of the application to be selectable. This folder is; \<installation_folder>\map". Currently, only ".bmp" and ".jpg" file formats are supported.

Once the map is loaded, it needs to be calibrated.

5.9.4. Map Calibration

The map calibration establishes a relation between the pixels of the map and the corresponding geographical points on the earth. This allows the sensors' geographical management tasks to be performed using the features in the map controls.

To access the calibration mode, right-click on the map surface and select the "**Map Background Calibration**" option:



Once in the map calibration mode, the map calibration panel is displayed:

1. **Calibration steps reminder**: description of how the calibration process is performed.
2. **First point data**: position of the first map point on the map file and the text fields to enter the corresponding geographical coordinates.
3. **Second point data**: position of the second map point on the map file and the text fields to enter the corresponding geographical coordinates.
4. **Perform Calibration button**: Calibrates the map.
5. **Close link**: closes the calibration panel.

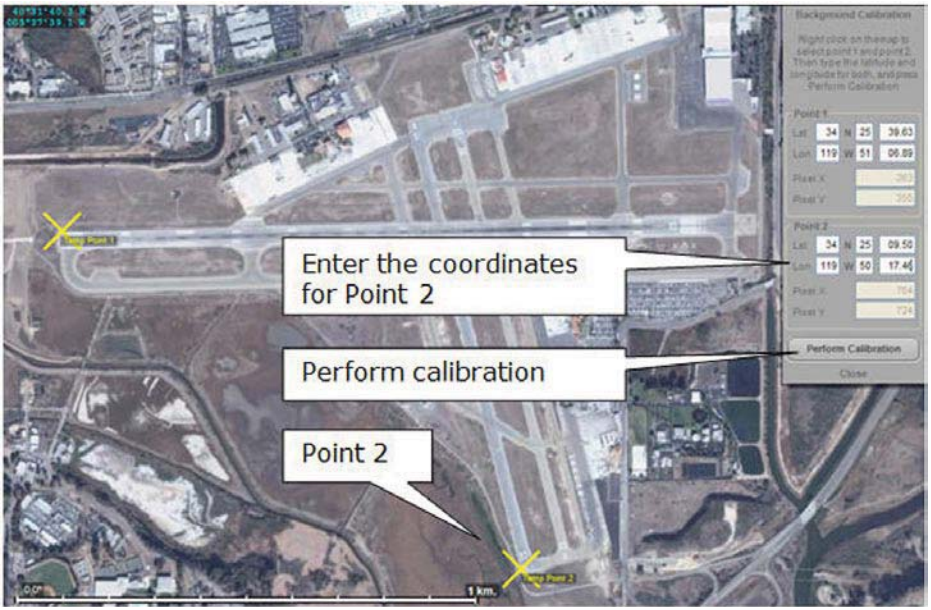
The calibration process involves selecting two points of known geographical coordinates and entering those coordinates into the Background Calibration window. For accuracy in the calibration process it is important to select two distinct points as far from each other as possible.

Note: The user must know the exact Longitude and Latitude for these two points. This can be acquired locally with a GPS, or by using readily available third party mapping software capable of displaying coordinates for any given point.

First, right-click on a point of the map for which the coordinates are known and select "**Get Coordinates for Calibration Point 1**":

Once a calibration point is selected, it is displayed on the map:

Now, select a second point on the map by repeating the previous step and clicking on "**Get Coordinates for Calibration Point 2**."



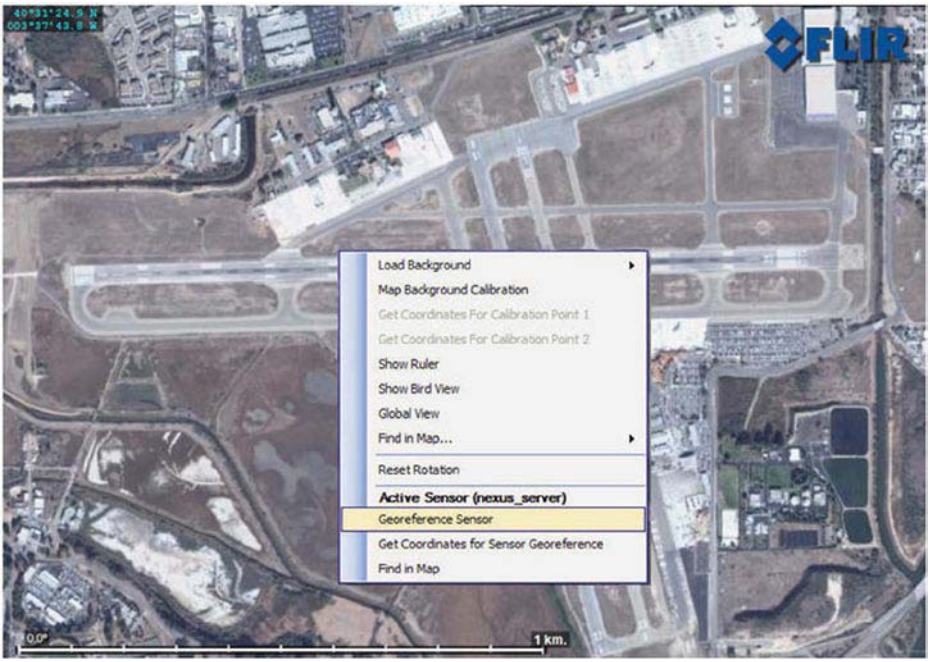
Once the two calibration points are selected and the corresponding geographical values entered, click the "**Perform Calibration**" button to finish the calibration process.

5.9.5 Sensor Geo-reference

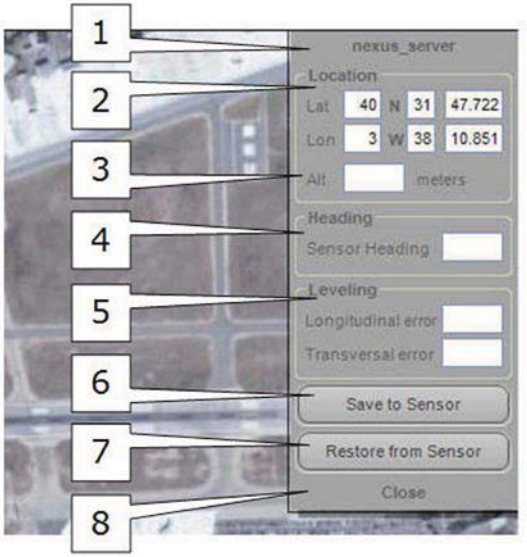
To locate the connected sensor(s) on the map, the user must geo-reference the sensor. The sensors' geo-reference process can be performed in a few simple steps via the map control.

NOTE: To geo-reference a sensor, it must be the active sensor and control must be owned.

Once the active sensor is selected, right-click on the map surface and select the "**Georeference Sensor**" option:

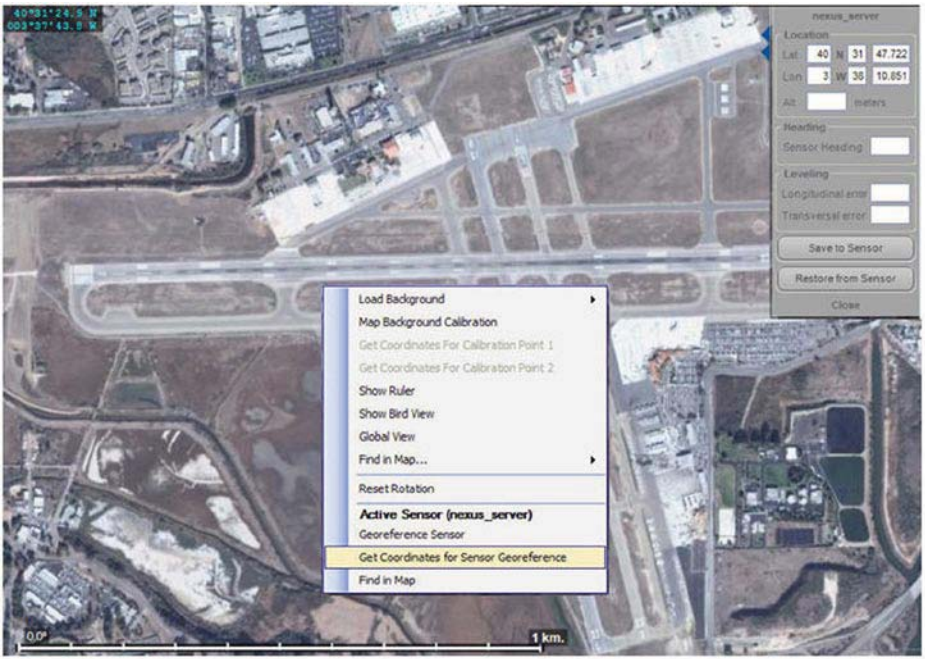


While in geo-referencing mode, the sensor geo-reference panel is displayed on the upper right-hand corner:

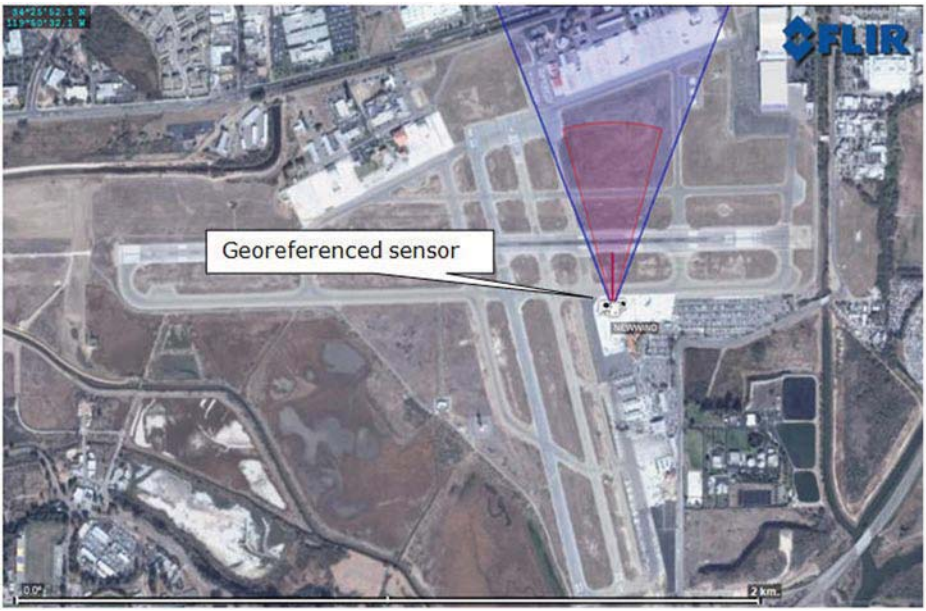


1. **Active sensor name**: displays the name of the sensor that is currently being geo-referenced.
2. **Current sensor location**: displays and allows modifying the sensor current location.
3. **Current sensor altitude**: altitude in meters (above the ground) of the sensor.
4. **Current sensor heading**: displays and allows modifying the sensor current heading.
5. **Current sensor leveling**: displays and allows modifying the sensors' current leveling.
6. **Save to Sensor button**: stores the current values in the sensor, thus performing the geo-reference.
7. **Restore from Sensor button**: retrieves the current geo-reference values stored in the sensor.
8. **Close link**: closes the sensor geo-reference panel.

One way the sensor's geographical location can be entered is by manually typing the coordinates into the geo-reference panel. The other way is to place the cursor on the map in which the sensor is located then right-click and select "**Get Coordinates for Sensor Georeference**". This will take the latitude and longitude of the position clicked on by the mouse, and place those coordinates into the sensor's geo-reference panel.



Once the geo-reference values are committed by clicking on the "**Save to sensor**" button, the sensor will be displayed on the map in the provided coordinates:



By default, FSM will place a sensor on the map aligned with geographical north. If this is not the case, the Sensor Heading adjustment will correct this.

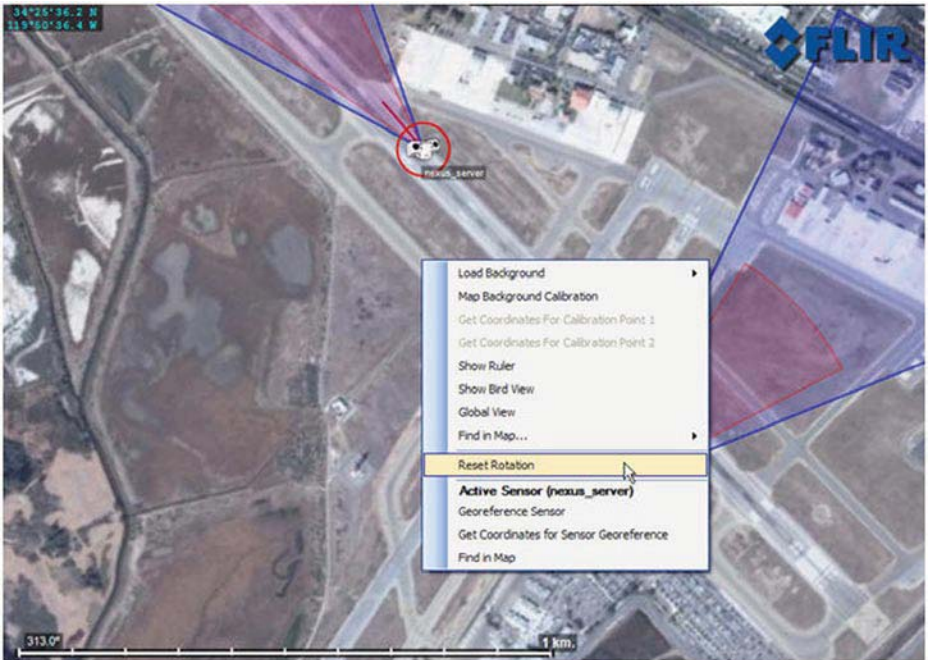
NOTE: the easiest way to correct a sensor heading is to match the camera image FOV content to map content.

If the sensor cannot be mounted on a level plane to the horizon, a user can correct these leveling errors by using the Longitudinal Error field to correct a tilt in the front-to-back mounting, and the Transversal Error to correct a tilt in the right-to-left mounting.

5.9.6 Map Rotation

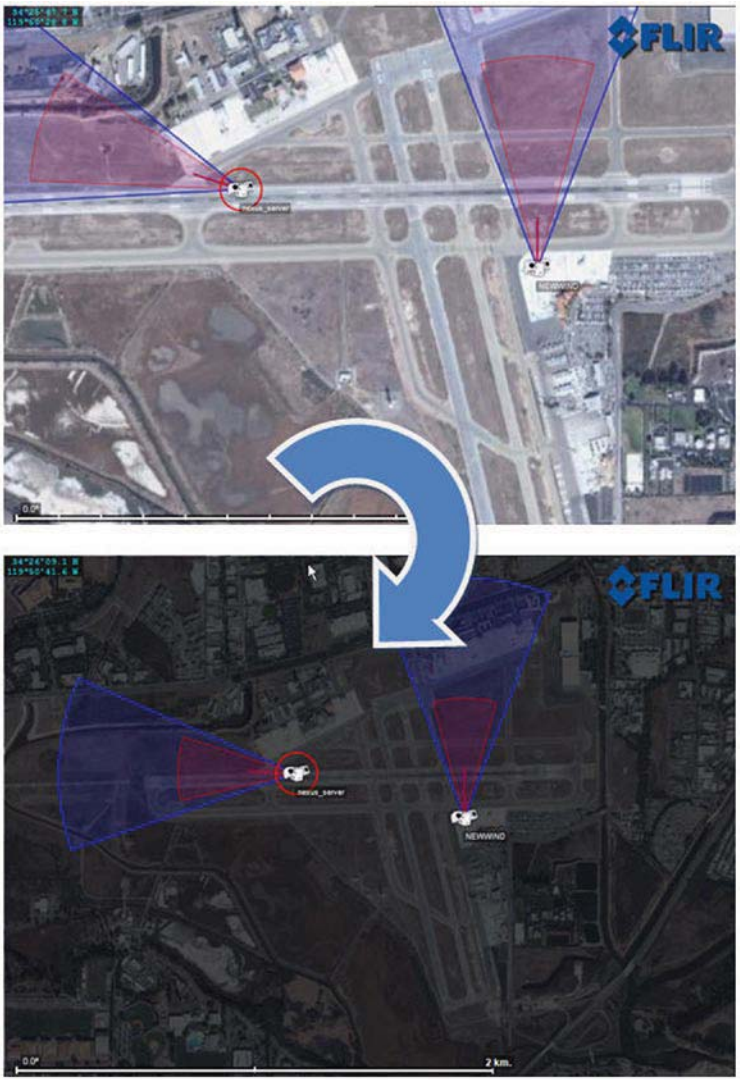
In some cases rotating the map may provide a better or more logical view of the area to survey. To rotate the map, use **alt + mouse** wheel or use **Ctrl + R/Ctrl + Shift + R**.

To reset the map to its original position (North-up), the user can use **Ctrl+N**, or right-click on the map and select **Reset Rotation**:



5.9.7 Map Background Opacity

To adjust the opacity of the map background, click on the map once then press "**B**" to increase the opacity. The map will get dimmer and the sensors will stand out:



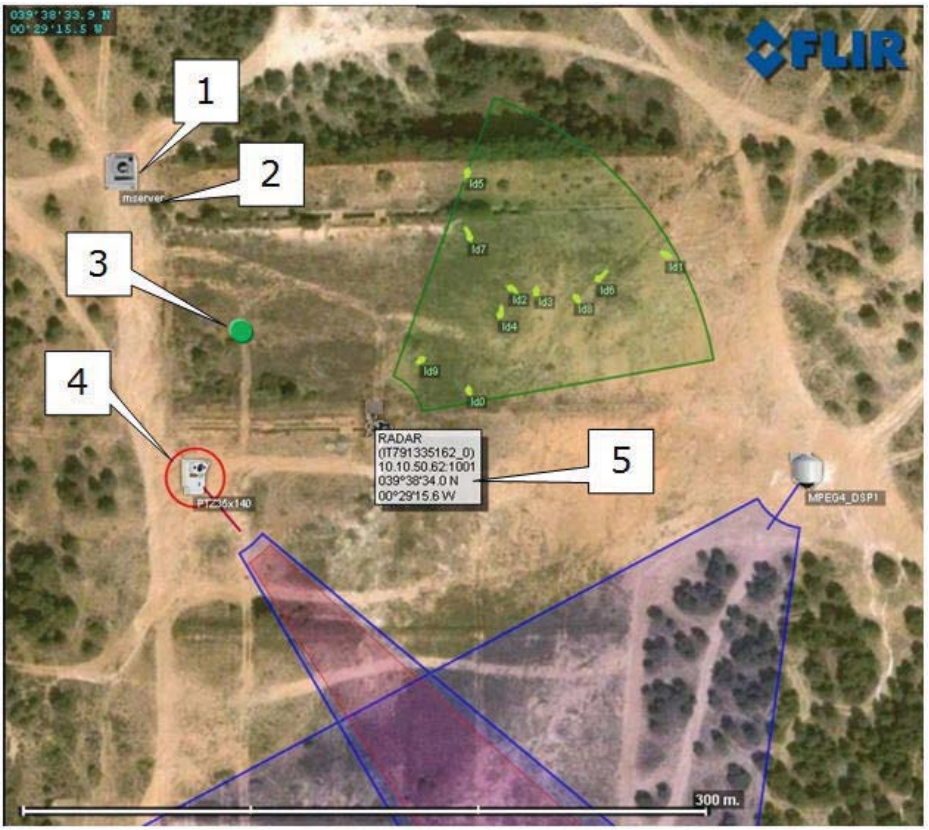
To decrease opacity, press **Shift+B.**

5.9.8 Sensors Display

The sensors that can be displayed on the map, usually have an associated set of graphics, (depending on the sensor type) that will display the sensor status data.

5.9.8.1 General

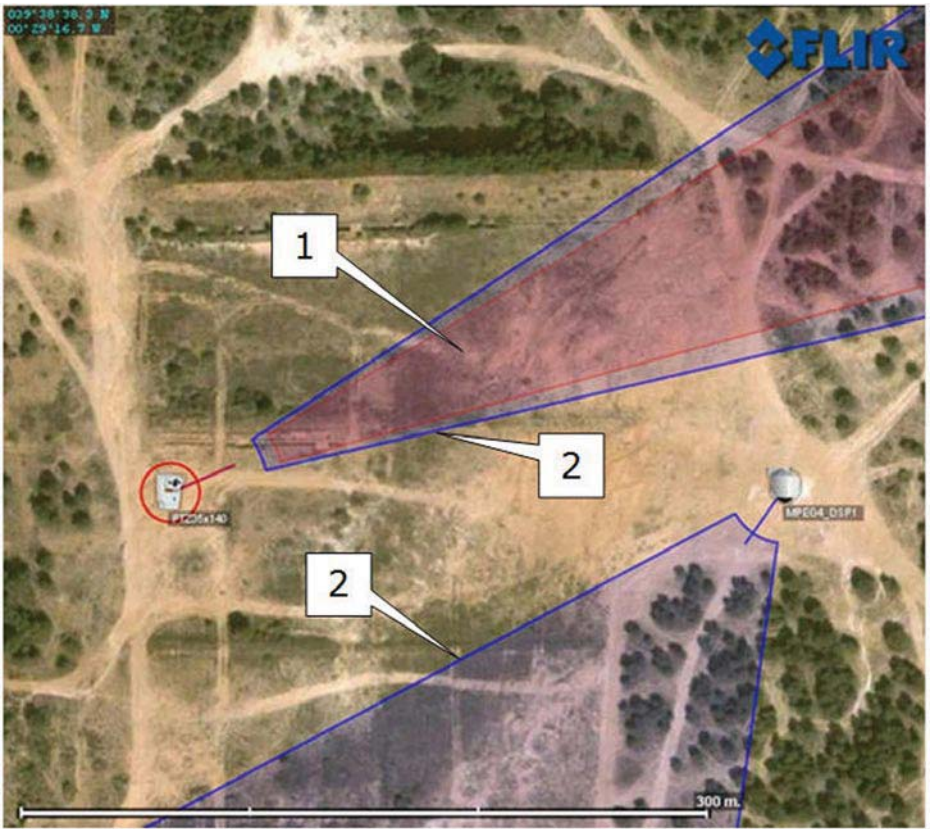
Some of the map sensor status graphics are common to all sensor types:



1. **Disconnected sensor icon**: the disconnected sensors are grayed out, as in the "mserver" icon displayed on the upper left corner of the image above.
2. **Sensor name**: the sensor name is displayed on the map surface below the sensor icon.
3. **Unknown sensor**: sensors for which there is no associated image are displayed on the map as a plain-colored dot.
4. **Active sensor ring**: the active sensor is displayed on the map surface by a plain-colored ring around the sensor.
5. **Sensor summary**: the sensor summary is displayed when placing the mouse over the sensor icon.

5.9.8.2 Cameras

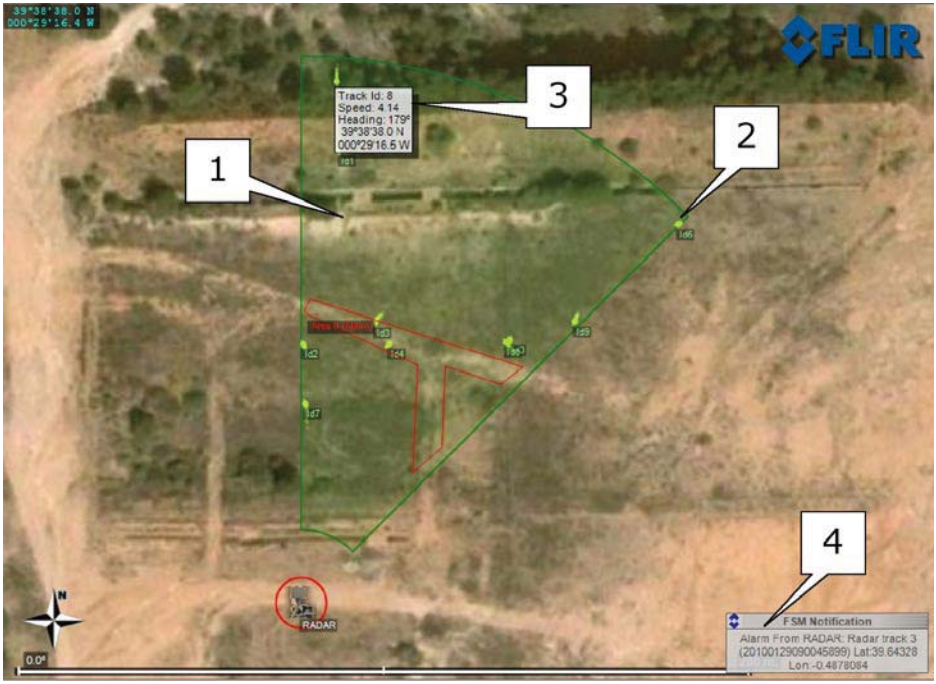
If the sensor has any cameras associated with it, a camera's expected viewing area is shown by red and blue cones on the map. The expected viewing area is determined by the camera's FOV, height, and angle of tilt.



1. **IR camera expected viewing area**: the red cone is the IR cameras viewing area calculated by the IR's field of view (FOV), height of sensor and angle of tilt on the pan tilt.
2. **DLTV camera expected viewing area**: the blue cone is the DLTV cameras viewing area calculated by the DLTV's field of view (FOV), height of sensor and angle of tilt on the pan tilt.

5.9.8.3 Radars

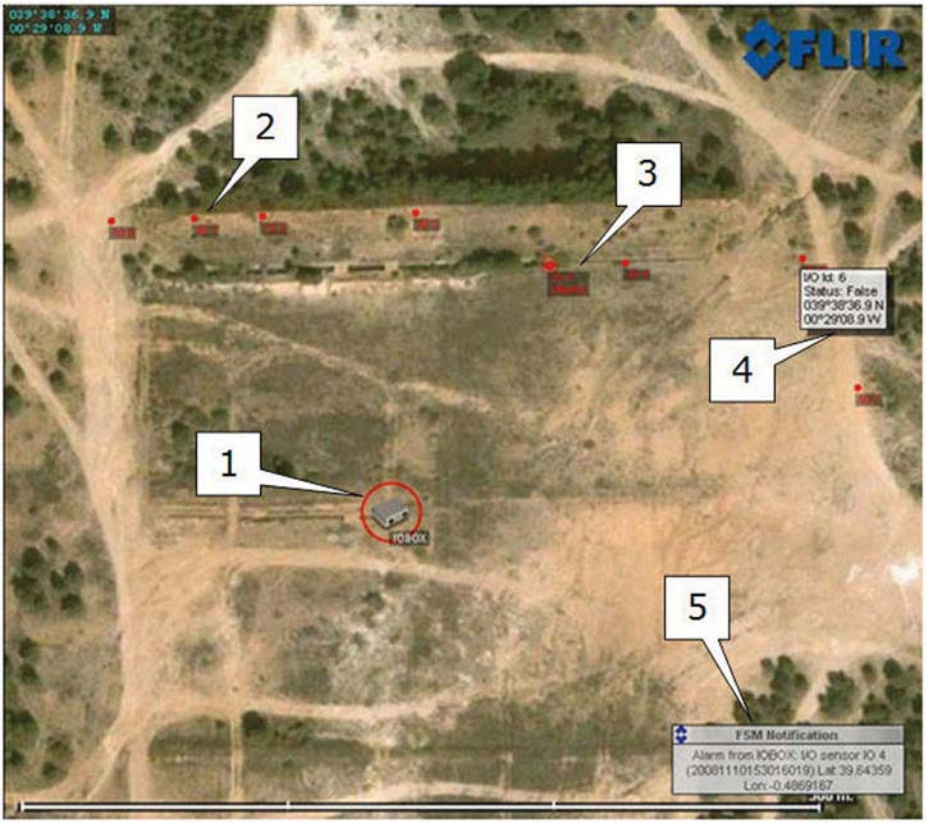
The radar-type sensor status data is displayed on the map surface as shown below:



1. **Scan sector**: the radar scan sector is displayed in green on the map surface.
2. **Radar tracks**: each radar track is displayed on the map surface including its identifier, as a text label beside it, and a brief trail to show its history.
3. **Radar track summary**: the radar track summary is displayed when the mouse is placed over it.
4. **FSM Notification**: a notification displays, indicating an alarm has been triggered and which sensor has triggered it.

5.9.8.4 I/O Sensors

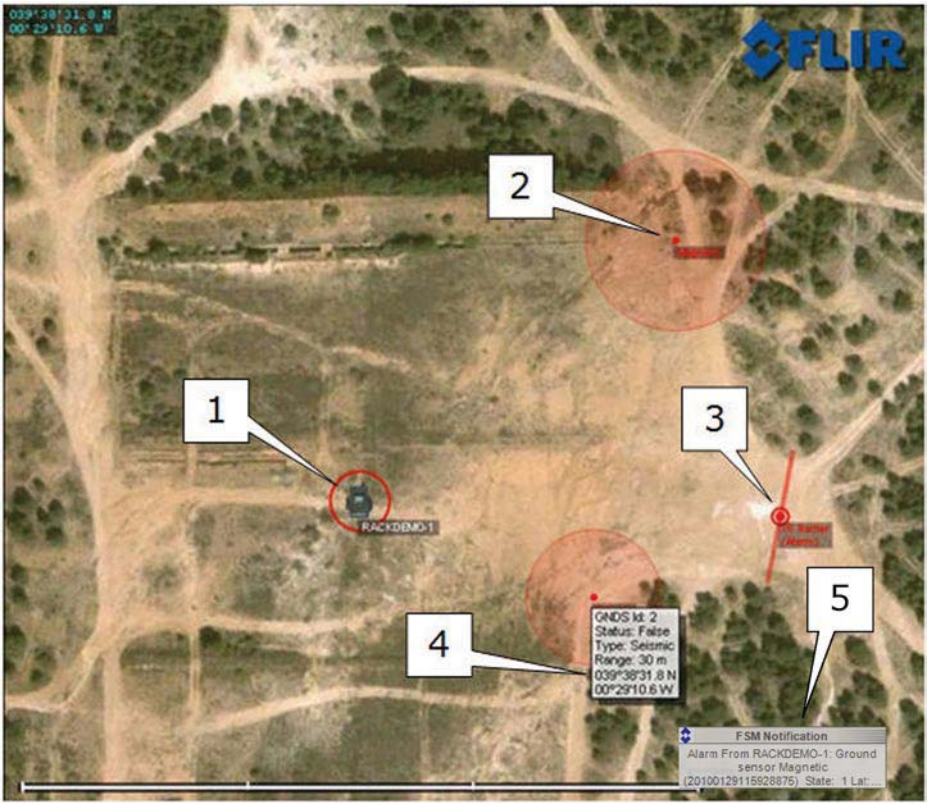
The I/O-type sensors are displayed on the map surface, including both the I/O box location and the sensors location:



1. **I/O box icon**: the sensor icon displayed on the map shows the I/O box location.
2. **Sensors**: the I/O sensors are displayed on the map as dots with an identifier label.
3. **Sensor in alarm status**: when an input sensor is in alarm, it is shown on the map surrounded by a ring and the word "Alarm" can be read on its label.
4. **Sensor summary**: the sensor status data summary is displayed when the mouse is placed over it.
5. **FSM Notification**: a notification displays, indicating an alarm has been triggered and which sensor has triggered it.

5.9.8.5 Ground Sensors

The ground-type sensors are displayed on the map surface, including both the base station location and the sensor's location:



1. **Base Station Receiver icon**: the sensor icon displayed on the map shows the base station location.
2. **Sensors**: the Ground sensors are displayed on the map as dots, a graphic depicting its range, if available, and an identifier label.
3. **Sensor in alarm status**: when a ground sensor is in alarm, it is shown on the map surrounded by a ring and the word "Alarm" can be read on its label.
4. **Sensor summary**: the sensor status data summary will be displayed when the mouse is placed over it.
5. **FSM Notification**: a notification displays, indicating an alarm has been triggered and which sensor has triggered it.

5.9.9 Sensor Management

Several sensor management tasks can be performed from the map. Some of these tasks are common to all sensors, others are type dependant, and some may involve multiple sensors of more than one type.

5.9.9.1 General Sensors Management

The general sensor management options are displayed when right-clicking over the sensor icon:

1. "**Set as Active Sensor**": sets the selected sensor as the active one.
2. "**Connect"/"Disconnect**": allows managing the connection status of the sensor.
3. "**Request Control"/"Release Control**": allows requesting/releasing control of the sensor.

5.9.9.2 Camera-type Sensors Management

The following actions can be performed over a camera-type sensor using the map:

- **Aiming**: being the active sensor a camera-type sensor and the cursor mode the "**Aim**" cursor mode, left-clicking over the map surface will command the sensor to point to the geographical coordinates the clicked map point stands for.

5.9.9.3 Radar-type Sensor Management

The following actions can be performed over a radar-type sensor using the map:

- **Area creation**: the radar areas can be created by selecting the "**Edit Area**" cursor mode.

5.10 Video Wall Setup

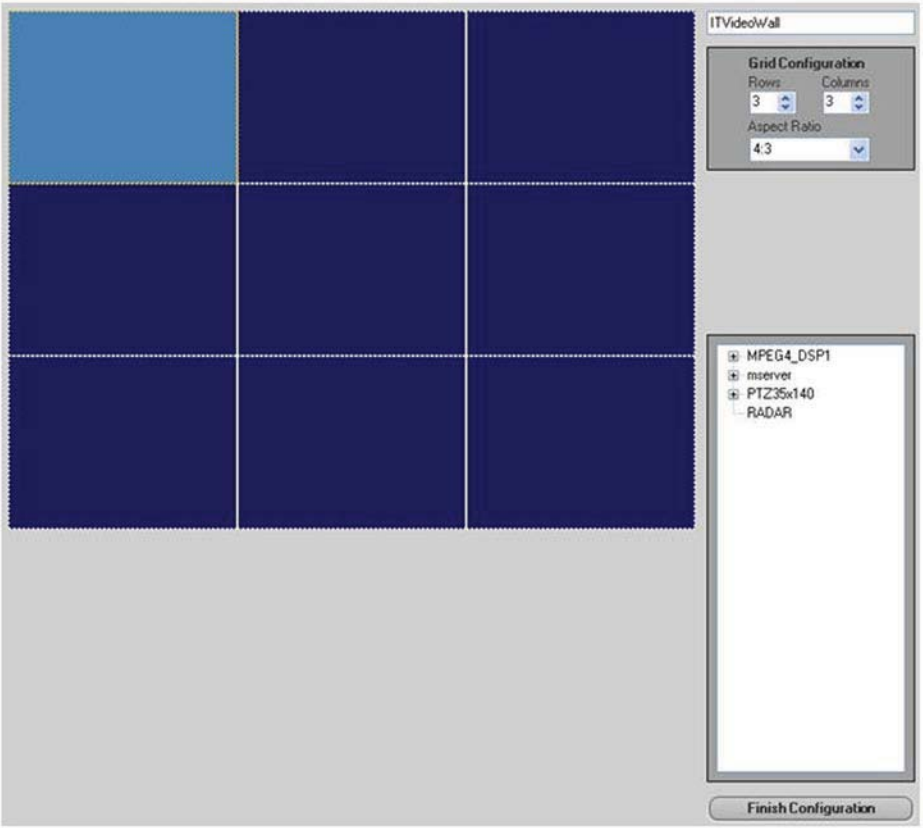
The video walls can be displayed by clicking on the "**View**" button on the toolbar, or by clicking on the adequate panel header:

Once the video wall is displayed, it can be configured by entering the configuration mode. The configuration panel is displayed by clicking on the "**<<**" button on the upper left corner of the video wall. This button is visible only when the mouse is placed over its location.

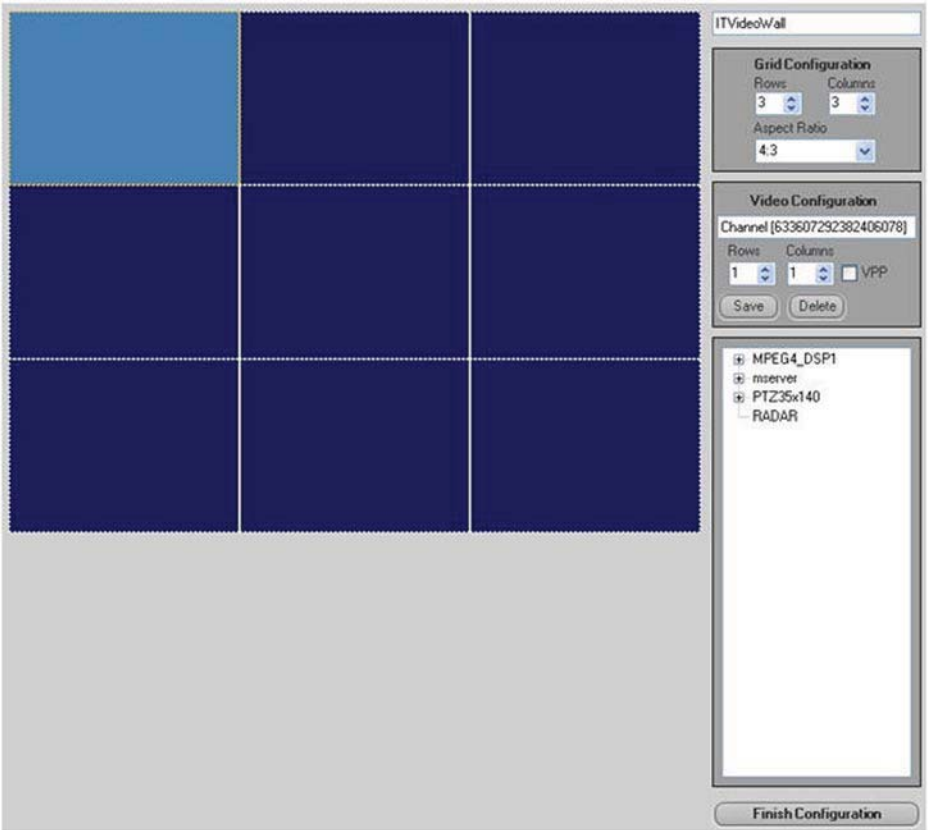
5.10.1 Basic Setup

NOTE: When no license is loaded, only one video window is allowed per video wall.

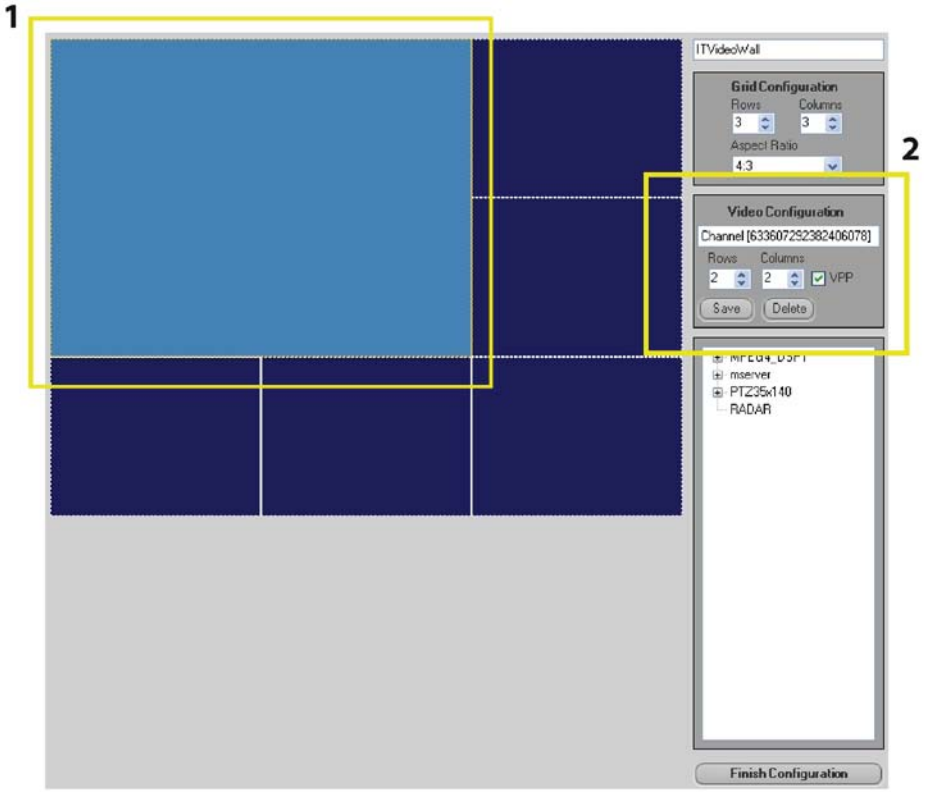
The first step to building a video wall is to organize the video tiles using the grid configuration panel controls:



Once the grid is organized, a video player instance can be configured in a grid position by double clicking on it; the selected video window changes color to a lighter blue:



The video window can be set up using the Video Configuration panel controls (2):

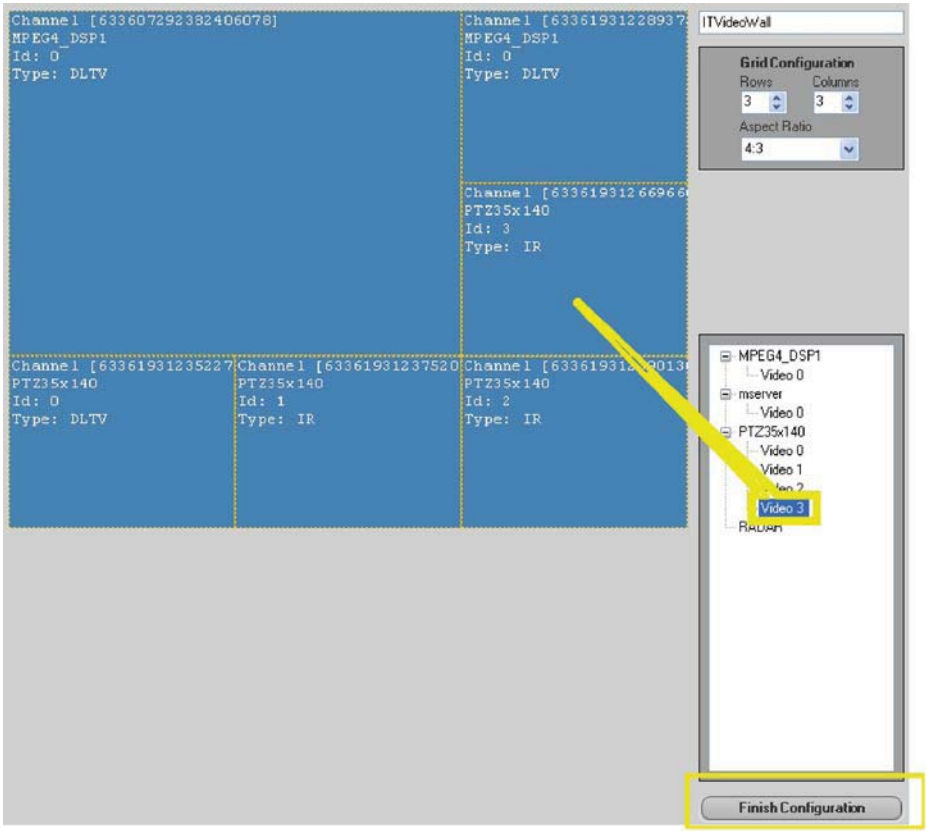


In this example we have configure the video window (1) to occupy 2 rows and two columns. To do this, use the up/down arrows in the Row and Columns fields:

NOTE: If Video Post Processing (VPP) functions are needed, the VPP box must be checked.

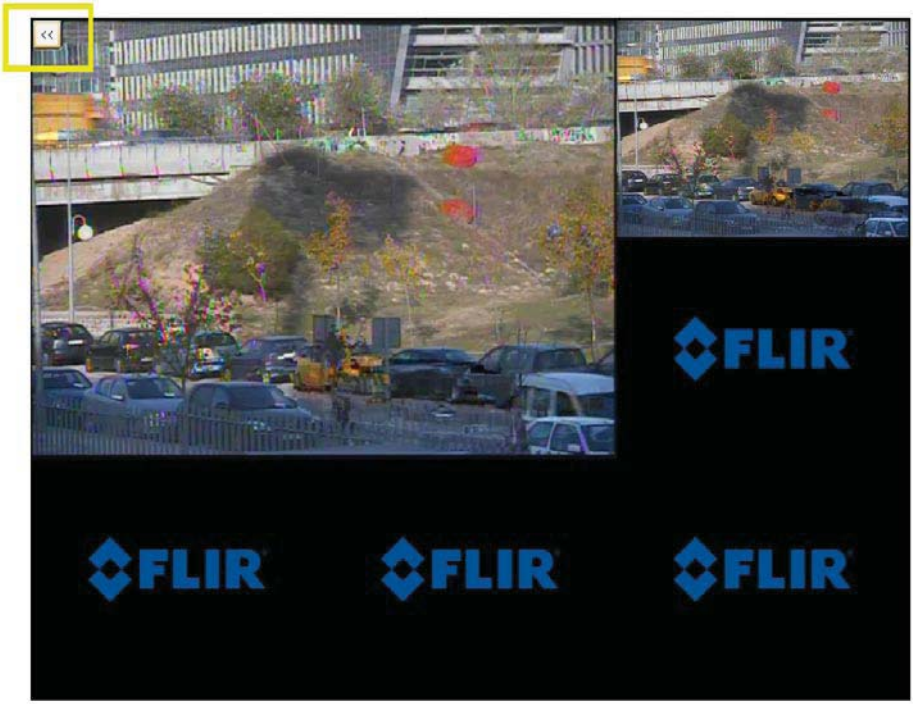
The video configuration must be saved for the changes to be effective. The **Save** button must be clicked in the Video Configuration box before any video source can be assigned to that window

Once the video configuration is saved, a video can be dragged from the sensors list to the selected video panel to assign the video source to the video player. To do so, simply click and drag the video source to the desired video panel:

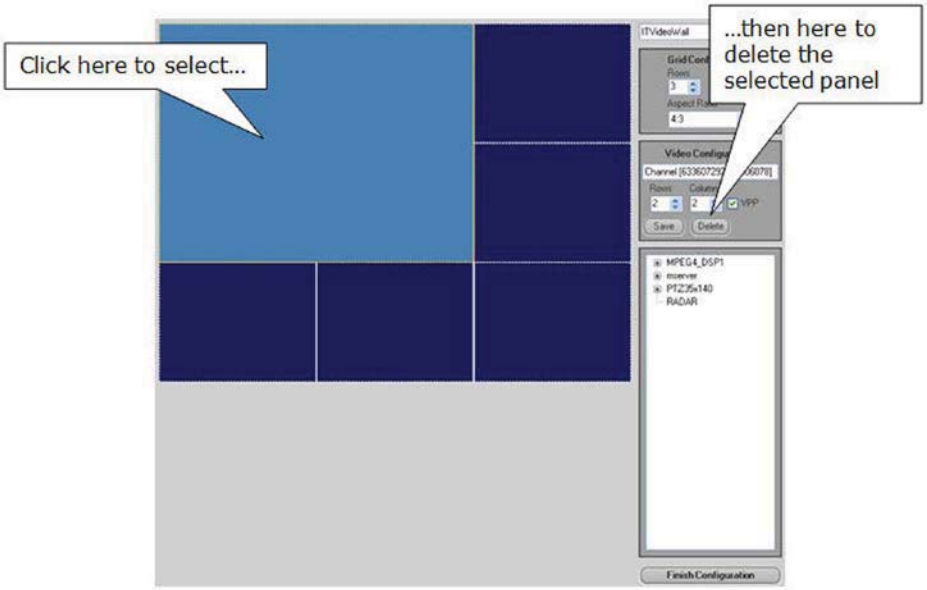


Once the video wall is configured, click on the "**Finish Configuration**" button to display the video wall.

The video configuration screen can be returned to at any time by pressing the "**<<**" button, which is shown when the mouse pointer is close to the upper-left corner of the video wall:

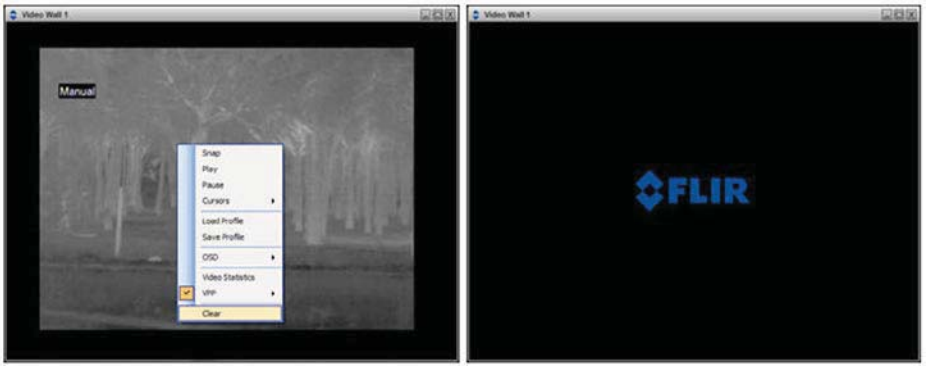


To clear a configured video panel from the video configuration window, click on it and then click Delete in the video configuration box:



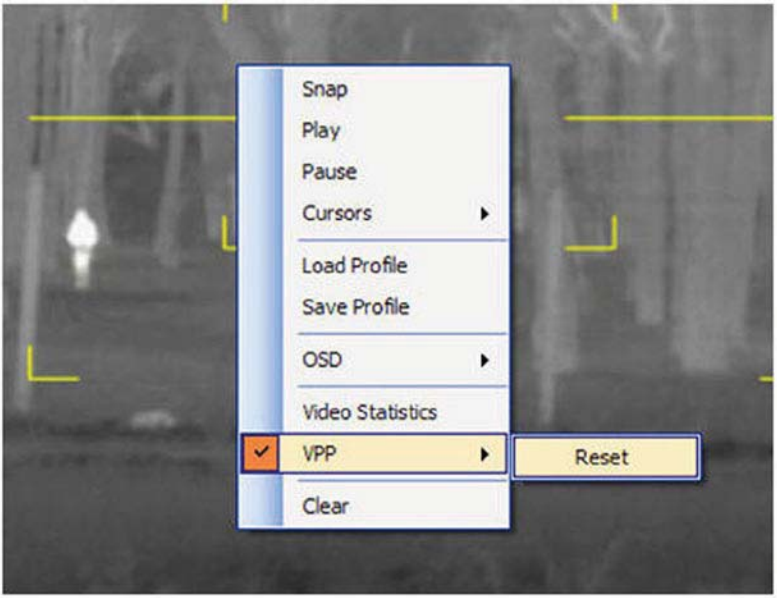
5.10.2 Clearing a Video Wall

To clear the video from a video wall, right click on the wall and select **Clear**. The video is cleared from the window and the video stream is closed. Then the window returns to a black screen displaying a FLIR logo.



5.10.3 Setting up Video Post Processing (VPP)

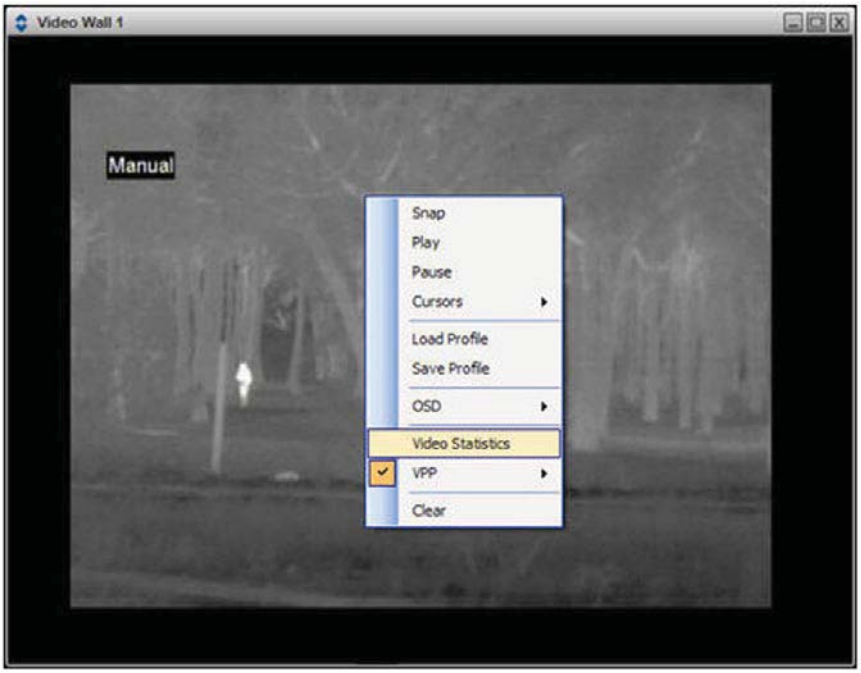
The **VPP** check box must be selected to use any of the video post processing functions, like the Surveillance Monitor, Image Post Processing, or adding some of the On Screen Displays options available in FSM. **VPP** can also be togged on/off from the context menu:



Resetting the **VPP** clears all created areas, filters or any other settings that make use of this function.

5.10.4 Setting up the Video Statistics

To get the video statistics associated with the video, right-click on the video window and select Video Statistics:



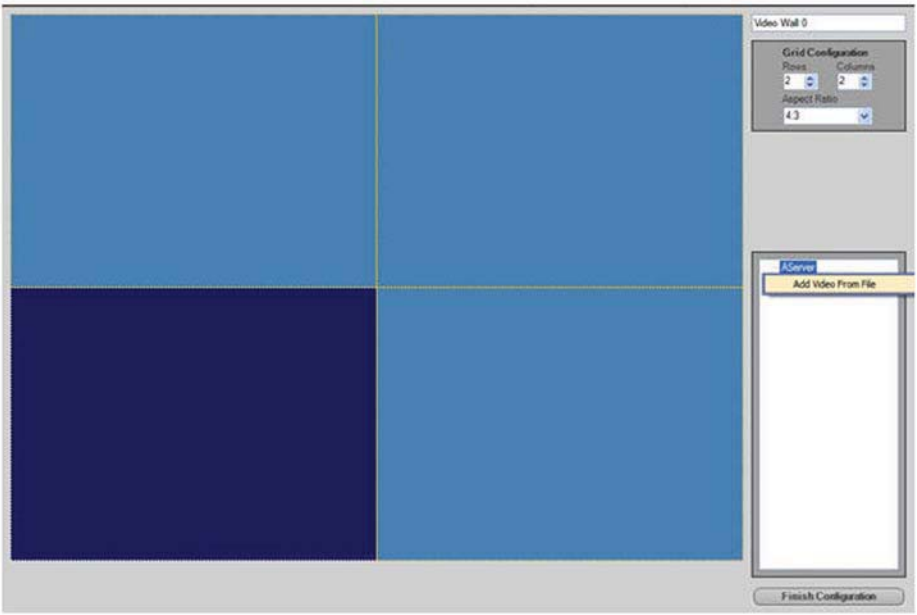
The upper right corner of the video window begins to display the Frames per Second; clicking on the arrow expands the displayed information:

VIDEO WALL KEYBOARD SHORTCUTS

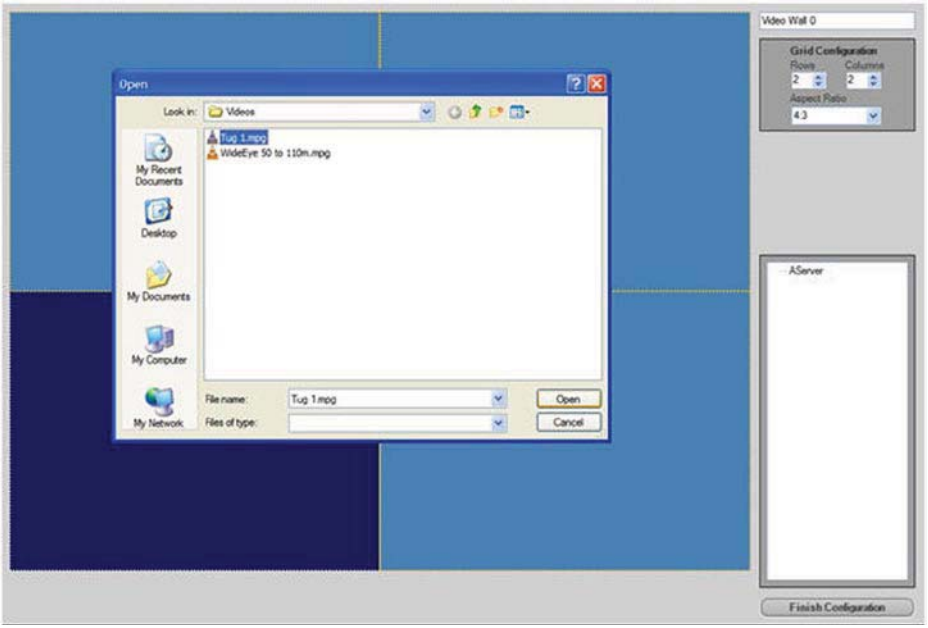
A	Arrow cursor mode (no action)
H	Hand cursor mode (pan)
R	Reticule cursor mode (aim)
Z/Shift+Z	zoom in/out cursor mode (continuous zoom on mouse down, stop on mouse up for the video)
Ctrl+F/ mouse double-click	Full Screen
Esc	Exit Full Screen

5.10.5 File Playback

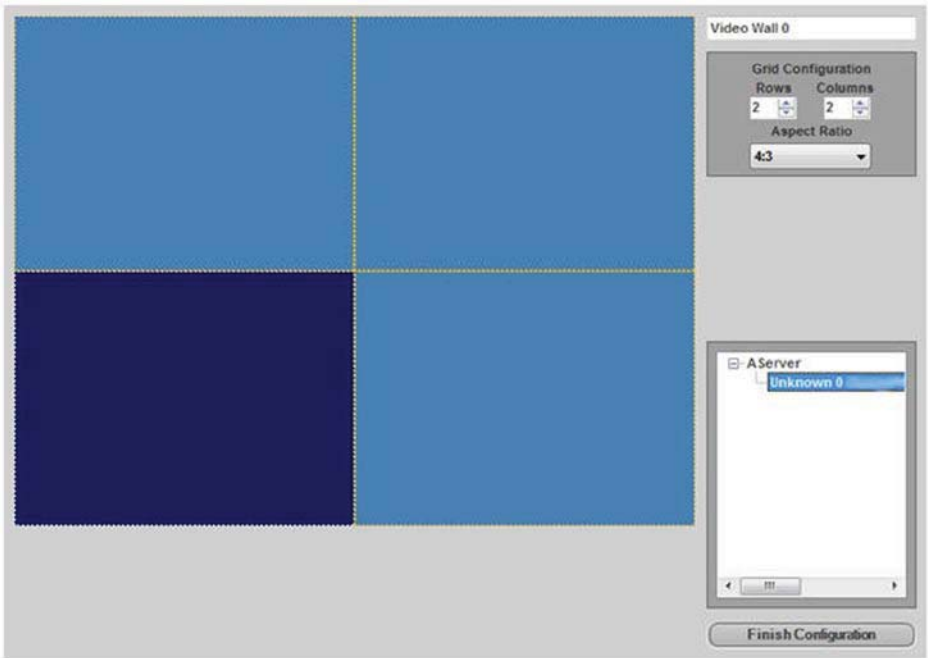
Before a file can be configured to be played in the video wall, **it must be assigned as a server video source**. Right-clicking on a server will show the context menu:



When the "**Add Video From File**" option is selected, a window prompting for the file to be opened is shown:

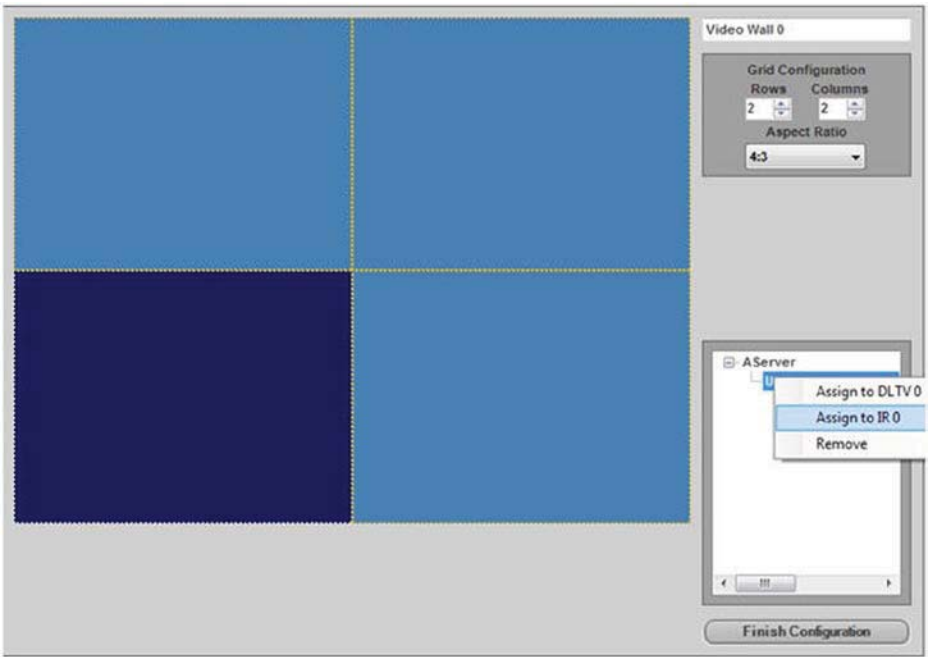


When a file is selected, a new video source is added to the server:



The video source ("file" type) can now be configured to be played as any other video source.

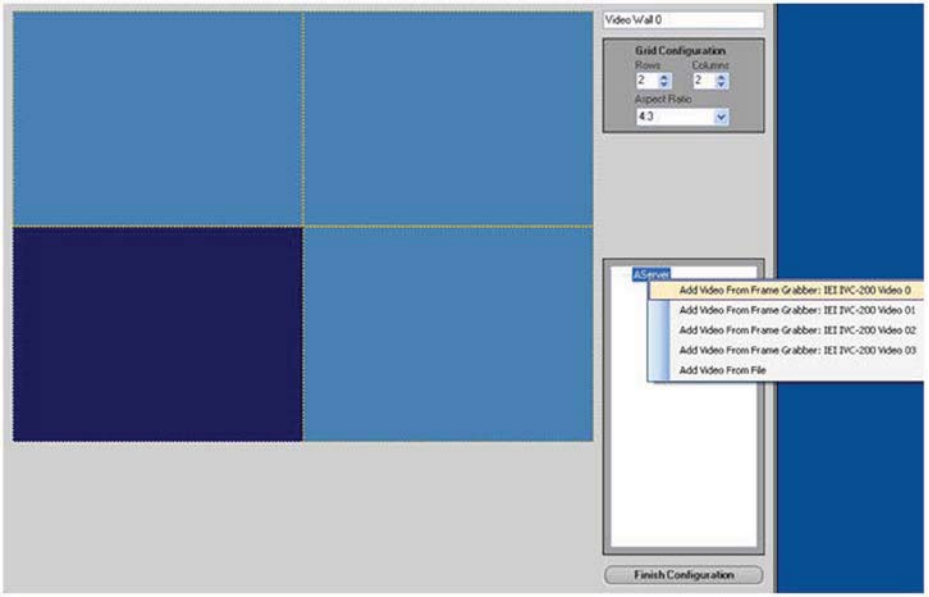
The video source ("file" type) can be assigned to a DLTV or IR camera, if any were configured in the server, or removed by right-clicking on it:



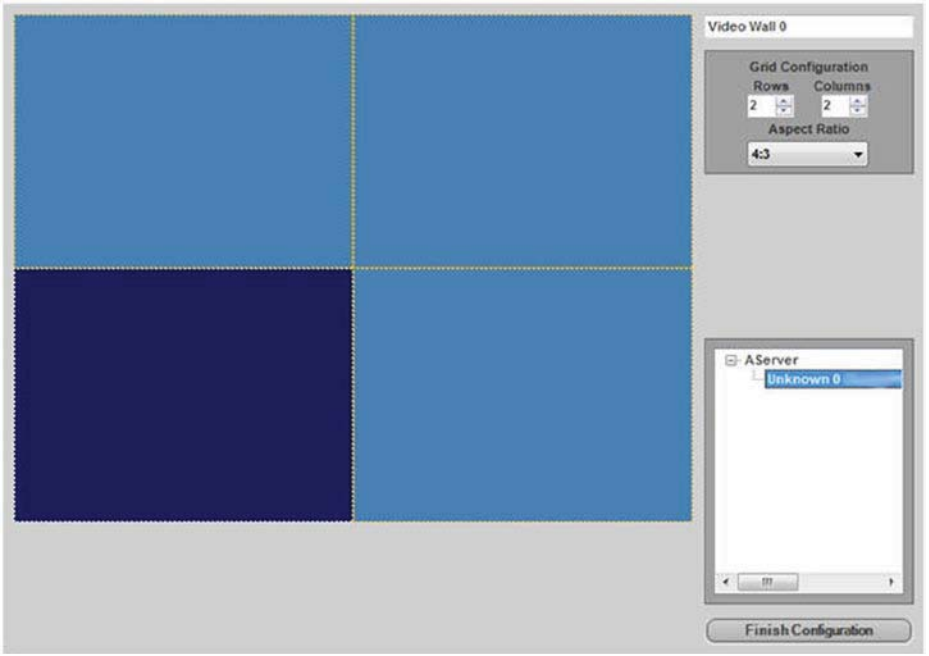
Assigning the video to a device will lead to having the device respond to the commands performed on the video coming from the file.

5.10.6 Frame Grabber Playback

Before a frame grabber can be configured to be played in the video wall, **it must be assigned as a server video source.** Right-clicking on a server will show the context menu:

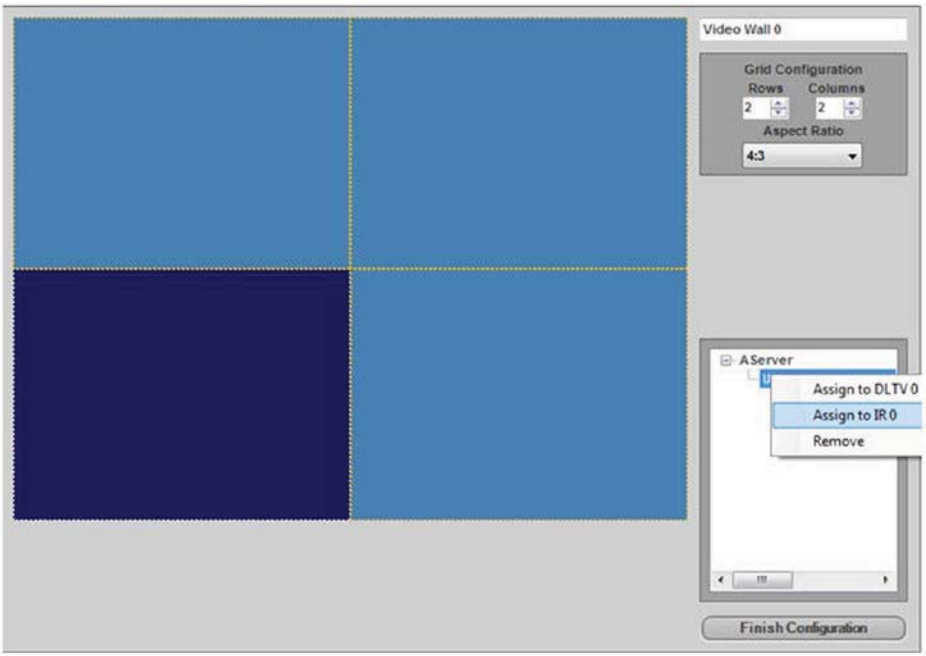


When a frame grabber is selected, a new video source is added to the server:



The frame grabber video source can now be configured to be played as any other video source.

The video source can be assigned to a DLTV or IR camera, if any were configured in the server, or removed by right-clicking on it:



Assigning the video to a device will lead to having the device responding to the commands performed on video coming from the frame grabber.

5.10.7 Video Playback Management

The video playback commands are available on both the context menu and the video toolbar. The context menu can be shown by right-clicking on a video player:

The "**Snap**" option takes a snapshot of the video and stores it in the media folder.

The "**Play**" and "**Pause**" commands control the playback.

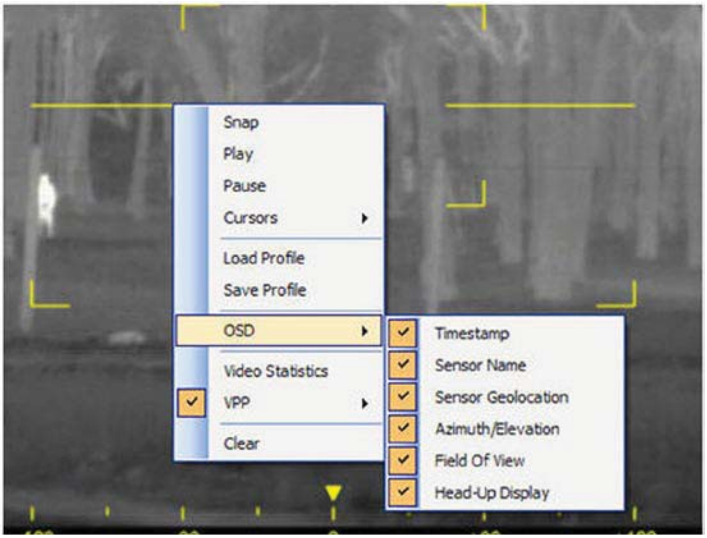
The video toolbar is displayed when the mouse is placed near the bottom edge of a video player:

The toolbar items vary depending on the video source type: stream, file or NDVR. The available commands, from left to right, are:

- **Play/Pause**: pauses/resumes the playback.
- **Snap**: takes a snapshot of the video and stores it in the media folder.
- **Select Speed**: sets the playback speed. (NDVR only)
- **Skip Backwards**: skips as many minutes as the speed factor backwards. (NDVR only)
- **Skip Forwards**: skips as many minutes as the speed factor forwards. (NDVR only)
- **Seek**: allows setting the playback to any position. (NDVR and files only)

5.10.8 Video Profiles Management

If a video is opened with the "**VPP**" (Video Post-Processing) option enabled, the video profiles management and the OSD (On Screen Display) options will be available in the context menu:



The OSD allows the user to superimpose the selected options on the video window. The following image shows an example with all of the options turned on:

5.10.8.1 Video Profiles Management

A user can save and load video settings from any VPP-enabled video window. These video settings are stored in the video profile.

To save the video window settings, right-click in the video window and select the "**Save Profile**" option.

To load previous video window settings, right-click in the video window and select the "**Load Profile**" option.

5.10.8.2 On-Screen Display

The OSD dropdown menu displays the available items that can be overlaid on a video image: the timestamp of the sensor, the sensor name, the sensor's geographical location, the azimuth and elevation of the sensor if applicable, the FOV of the video source, and a Heads-Up Display.

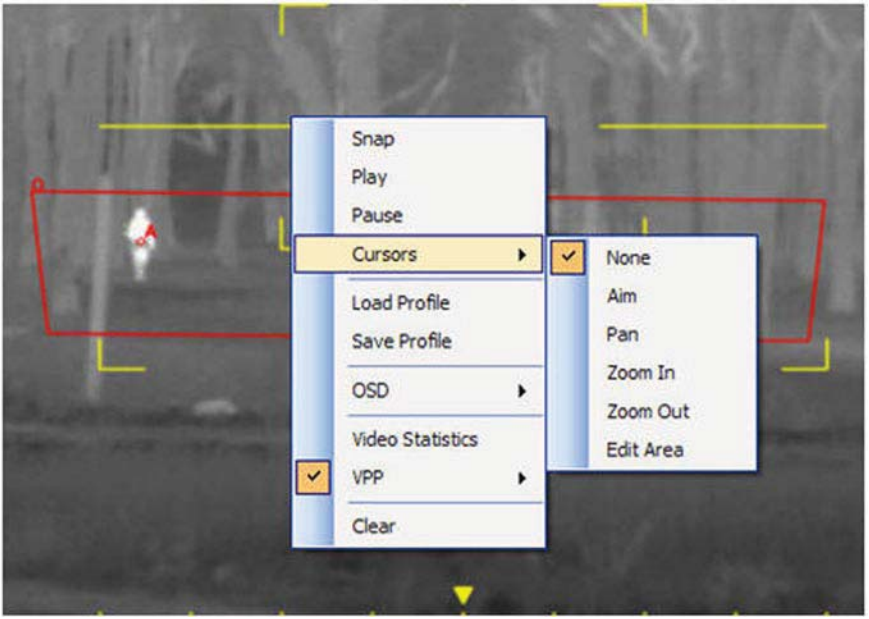
Each time a video configuration is created, the OSD values are set to the defaults configured in the Preferences panel (See section 5.3). However, the OSD settings are local to each video configuration and this menu allows customizing the OSD individually.

5.10.9 Cursor Modes

Some cursor modes allow performing commands to the sensor via the video wall video players:

- "**Aim**": this cursor mode allows aiming the sensor at the specified video position. If the shift key is pressed and the video post-processing is enabled, this cursor mode allows enabling the video tracker. (Only for PT cameras)
- "**Pan**": this cursor mode allows panning and tilting using the video player surface as if it were a touchpad. (Only for PT cameras)
- "**Zoom In**": this cursor mode allows sending "Zoom In" commands to the sensor the video is associated to.
- "**Zoom Out**": this cursor mode allows sending "Zoom Out" commands to the sensor the video is associated with.
- "**Edit Area**": this cursor mode allows performing the area creation process inside of the video window.

The user can select the cursor mode using the icons on the Toolbar, or from the context menu in any video player window. To do so, right-click in the image, select Cursors, and select the one to use:



5.10.10 Area Addition

The area addition process begins with selecting the Edit Area cursor mode. Once the "Edit Area" is selected, the user can draw a polygon area in a VPP video window. Clicking in the video window sets the beginning point in the area and allows the user to select the type of VPP area they want to draw:

When the area type is selected, new area vertexes can be added by clicking on the video surface:

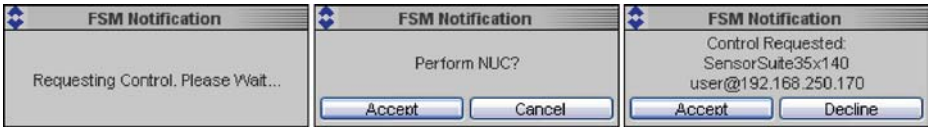
Double-clicking will set the last area vertex and finish the area creation process:

The area identifier ("0") will appear when the area creation process is finished and the polygon closed. Subsequent areas are identified with consecutively numbered area identifiers (i.e. "1", "2", etc.). The polygon is always closed, even during the creation process, unless the selected area type is "Wire."

NOTE: For detailed instructions on how to set up an area, please refer to **Appendix D: setting up the Surveillance Monitor.**

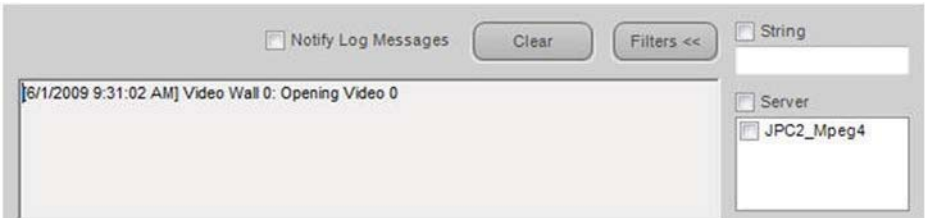
5.11 FSM Notification

The FSM Notification box will appear in the lower right-hand corner of the PC screen when a notification occurs. The notification box informs the client for many types of events. When the client is performing an action with another client they will receive a notification such as a request for control. The notification box also notifies the client when they attempt to perform a unique sensor feature such as performing a NUC (non-uniformity correction) with a thermal camera sensor. The client uses the notification box as a tool to help manage their network and sensors.



5.12 Log

The log panel displays the application status messages:

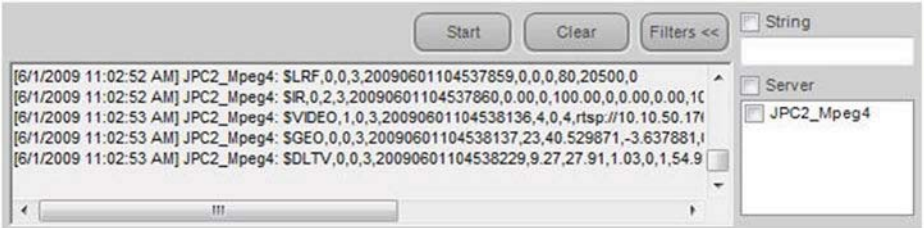


The log messages can be filtered by string and by server. These options can be shown or hidden via the "**Filters**" button.

If the "**Notify Log Messages**" check box is checked, all log messages will also appear as a FSM Notification.

5.13 NMEA Monitor

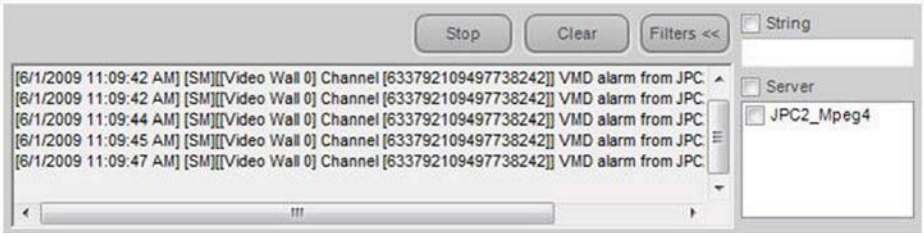
The NMEA Monitor displays the NMEA sentences received from the sensors:



The NMEA sentences can be filtered by string and by server just like the log messages. These options can be shown or hidden via the "Filters" button.

5.14 Alarm Monitor

The Alarm Monitor displays both the alarms received from the sensors, and the alarms that result from video post-processing:

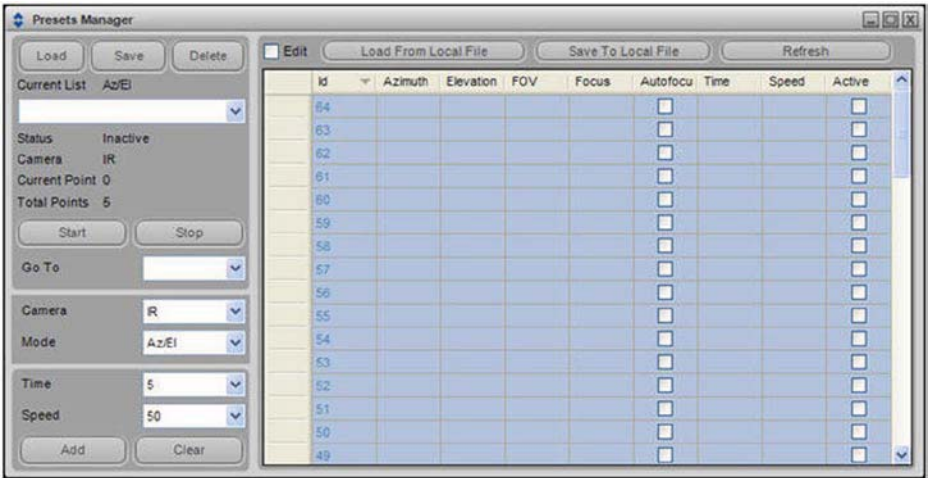

Stop
Clear
Filters <<
String
Server
JPC2_Mpeg4
[6/1/2009 11:09:42 AM] [SM][[Video Wall 0] Channel [633792109497738242]] VMD alarm from JPC
[6/1/2009 11:09:42 AM] [SM][[Video Wall 0] Channel [633792109497738242]] VMD alarm from JPC
[6/1/2009 11:09:44 AM] [SM][[Video Wall 0] Channel [633792109497738242]] VMD alarm from JPC
[6/1/2009 11:09:45 AM] [SM][[Video Wall 0] Channel [633792109497738242]] VMD alarm from JPC
[6/1/2009 11:09:47 AM] [SM][[Video Wall 0] Channel [633792109497738242]] VMD alarm from JPC

The alarms can be filtered by string and by server. These options can be shown or hidden via the "**Filters**" button.

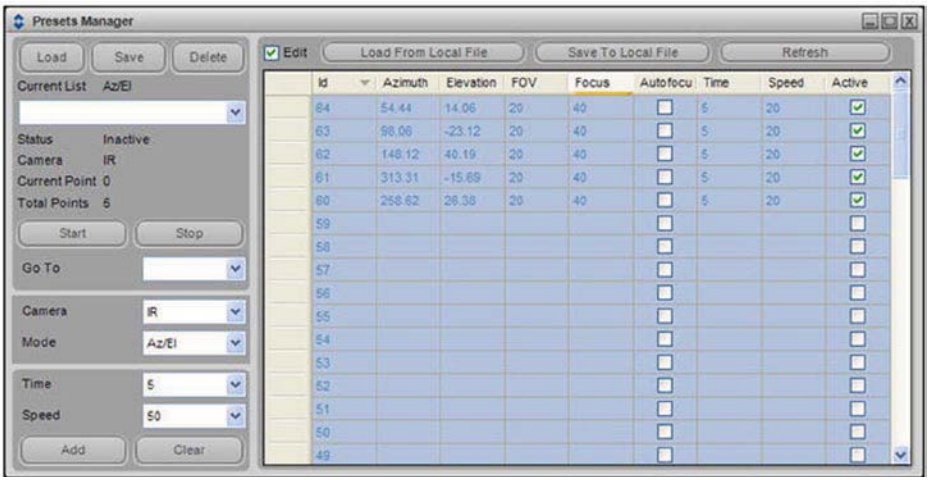
5.15 Scan Lists

Scan list management can be performed using the shortcuts on the "**Scan List**" section of the toolbar or via the Presets Manager.

To open the Presets Manager, click "**View->Presets Manager**":



The Presets Manager only communicates with the active server. When a server is set as active, the Presets Manager will display that server's current scan list:



Certain sensors can store and load scan lists directly from the sensor itself. The "**Load**", "**Save**" and "**Delete**" buttons, and the drop down box located in the upper left-hand corner of the Presets Manager, are used to manage these actions.

5.15.1 Configuring a Scan List

The client can create a scan list by using the "**Add**" button of the Presets Manager. The pan, tilt, zoom, and focus position of a camera sensor are placed into a scan list point. The client also can manually enter in the azimuth, elevation, FOV, and focus positions as a scan list point.

If the user pan, tilts, zooms, and focuses the camera to a desired location, then presses the "Add" button, the current position is then stored into the scan list as the next available scan list point. The "**Add**" button will use the selected "**Time**" & "**Speed**" parameters into the new scan list point.

The "**Time**" parameter represents how long the camera will stay at its current position, in seconds, until the camera begins moving to the next position.

NOTE: The "**Time**" counter starts once the pan tilt reaches the desired location. The "**Time**" counter will not account for the time it takes to zoom and focus the cameras. This will need to be accounted for when configuring a scan list.

The "**Speed**" parameter represents the velocity, denoted in degrees per second, the pan tilt will move to reach the next point in the scan list. This is restricted by the velocity limits of the pan tilt unit.

The "**Camera**" parameter denotes which camera is currently being run and configured with the scan list. This is important when configuring the scan list since pushing the "**Add**" button will take the zoom and focus positions from the camera selected in the "**Camera**" parameter.

The "**Mode**" parameter indicates how the scan list points are stored and read from the sensor. In almost every situation the "**Az/El**" mode is used.

All points on a scan list can then be manually edited, or entered by checking the "**Edit**" checkbox. Once the user is done manually editing/entering their changes, they should uncheck the "**Edit**" checkbox in order for those changes to be saved.

The "Refresh" button updates the scan lists data. This is intended for use in older servers that do not support the automatic update feature.

To remove all the points from a scan list hit the "**Clear**" button.

To remove only a single point, hit the "**Delete**" button

5.12.2 Loading and Starting a Scan List

Presets can be saved to a file by clicking on **Save to Local File.** The user can also load presets using the **Load From Local File** button.

The "**Start**" button performs two tasks when pressed; first, it will load the current scan list in FSM into the sensor, second, it will start the scan list. The scan list is managed in the sensor so it will continue running if the sensor is disconnected from the network, or FSM is closed.

The "**Stop**" button stops the current scan list.

The "**Go To**" parameter can be used when a user would like to go to a specific scan list point.

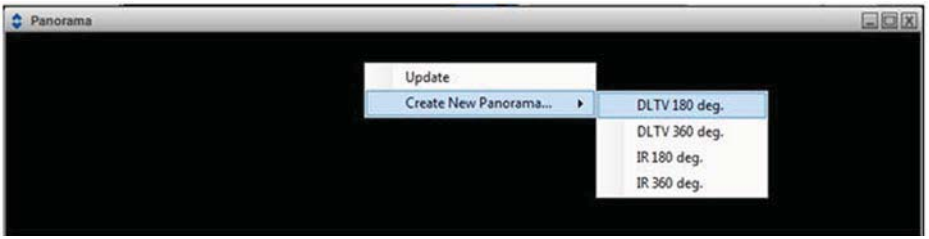
5.16 Panorama

This function allows for creation of a panoramic view using either the IR or the DLTV camera. A user can then double click on any spot of the panorama image and the pan tilt will aim to that spot.

The panoramic view is created using the Panorama control window. To display the Panorama, click the "**View**" menu button and select "**Panorama**":

Right-clicking on the Panorama surface displays the panoramic view, creation and updating options:

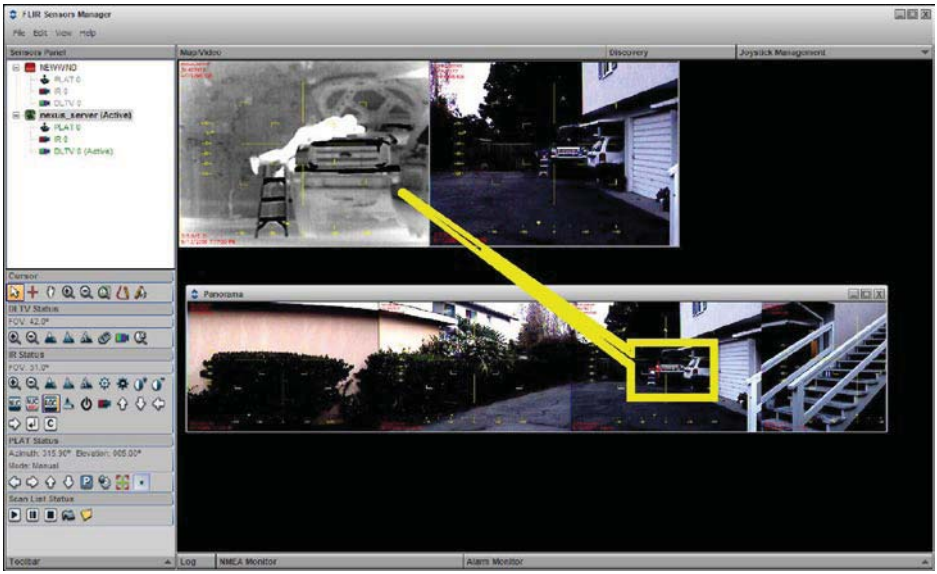
NOTE: The user must first open the video stream into a video wall window before attempting to create the panorama; otherwise, the panorama will not operate.



Once an option is selected, the sensor will turn through the selected number of degrees and take a series of consecutive snapshots, which are then automatically stitched into a panoramic view:

The panorama will continue to update its snapshots until the user puts the pan tilt sensor back into Manual mode. This is done by using the arrow buttons in the Toolbar or Control Panel, or by moving a joystick.

Using the "**Aim**" cursor mode or double-clicking on a point in the panorama points the pan and tilt sensors in that direction:



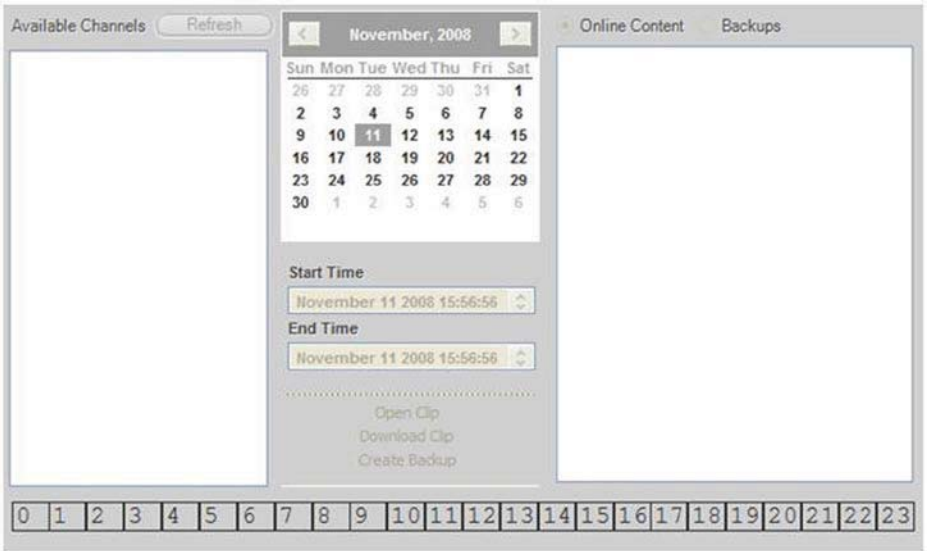
Some cursor modes allow performing commands via the panoramic view:

- "**Aim**": this cursor mode allows aiming the sensor at the specified position. This command can also be performed by double-clicking on the panoramic view when any other cursor mode is enabled.
- "**Pan**": this cursor mode allows panning the panoramic view.
- "**Zoom In**": this cursor mode allows zooming in the panoramic view.
- "**Zoom Out**": this cursor mode allows zooming out the panoramic view.

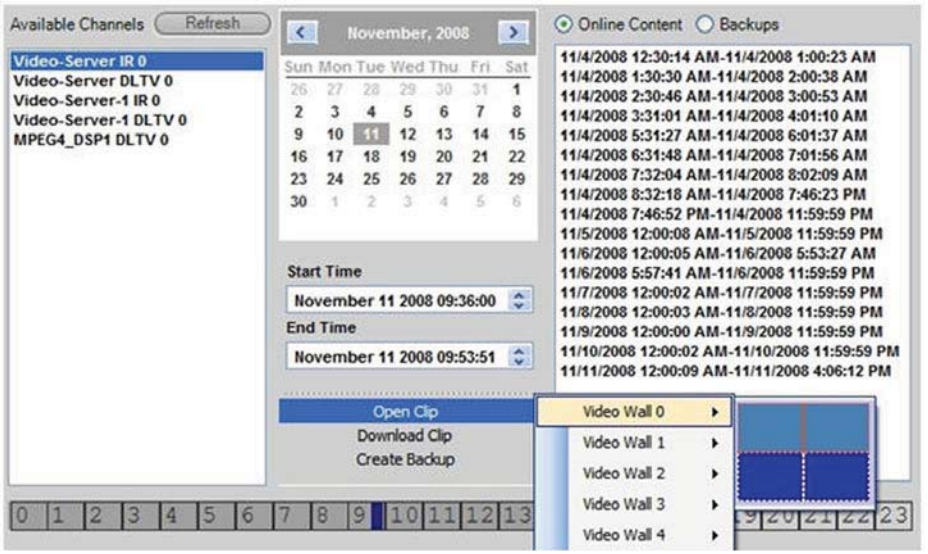
When selected, the "**Update**" function continues to scan the area and update the panorama picture sections. This process stops when the user changes PLAT mode to Manual, by either using the arrow buttons in the Toolbar or Control Panel or by moving a joystick.

5.17 NDVR Management

The NDVR management is performed via the NDVR panel. To display the NDVR panel, click the "**View**" button on the toolbar and select "**NDVR Panel**":


Available Channels
Refresh
November, 2008
Sun Mon Tue Wed Thu Fri Sat
Online Content
Backups
Start Time
November 11 2008 15:56:56
End Time
November 11 2008 15:56:56
Open Clip
Download Clip
Create Backup
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

The NDVR panel manages the active server. When an NDVR server is set as active, the NDVR Panel will display its data:



The displayed server data can be updated by clicking on the "**Refresh**" button.
The NDVR operations are always performed in the following three steps:

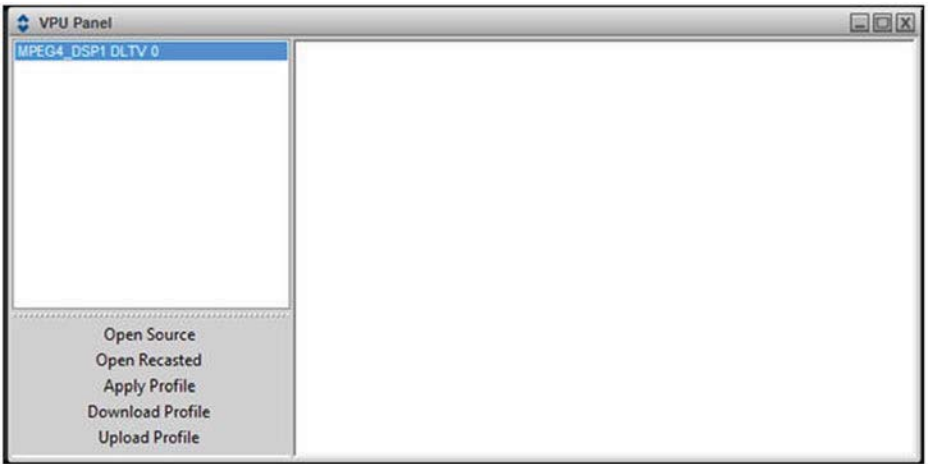
1. Select the channel from the available channels list on the left hand side.
2. Select the date using the calendar, the time bar and/or the date/time picker controls.
3. Select the appropriate command:
   a. Select the "**Open Clip**" option to open a clip in a video wall.
   b. Select the "**Download Clip**" option to download a clip into a file.
   c. Select the "**Create Backup**" to create a backup.

Backups are managed in the same way as the clips are. In order to access the available backups, the "**Backups**" option of the NDVR panel must be selected.

5.18 VPU Management

The VPU management is performed via the VPU panel. The VPU panel can be displayed by clicking on the "**View**" menu button and selecting "**VPU Panel**":

The VPU panel manages the active server. When a VPU server is set as active, the VPU Panel displays its data:



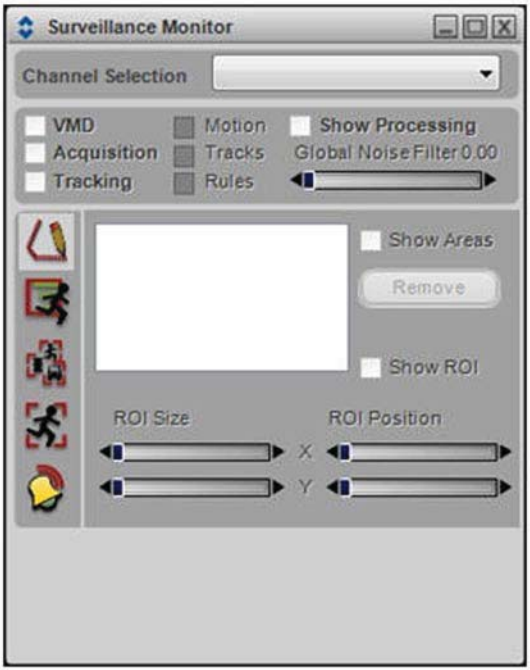
The VPU available commands are the following:

1. **Open Source**: opens the source video stream that is being processed in the selected VPU channel on the selected video wall window. The source server must be in the active servers list.
2. **Open Recasted**: opens the recasted video of the selected video channel on the selected video wall tile.
3. **Apply profile**: applies the selected profile to the selected channel.
4. **Download Profile**: downloads the selected profile.
5. **Upload Profile**: uploads and applies a profile.

The VPU alarms data is displayed in the alarms text box.

5.19 Surveillance Monitor

The surveillance monitor allows a user to perform video processing tasks on any video windows which have VPP enabled. The surveillance monitor can be displayed by clicking on the "**View**" button of the toolbar and selecting the "**Surveillance Monitor**" option:



The surveillance monitor manages the selected video channel. The channels can be selected via the channel selection drop down list or by clicking on the adequate video wall video player.

Only video channels that were opened with the video post-processing (VPP) can be selected. Please refer to section **5.10.3. Setting up Video Post Processing.**

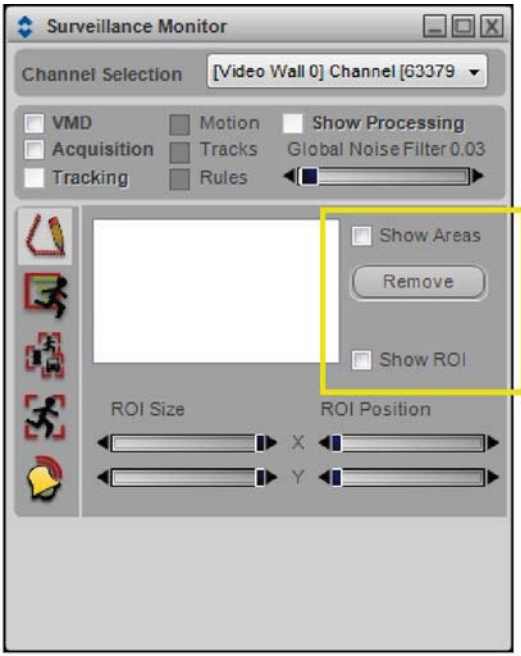
The main features are managed with the common controls placed right below the channel selection drop down list.

The specific features controls are placed in the corresponding sections. The sections can be accessed by clicking on the sidebar icons.

NOTE: For detailed information on surveillance monitor parameters and settings please refer to **APPENDIX D: Setting up the Surveillance Monitor.**

5.19.1 Areas

The areas section contains the controls needed to manage the video regions:



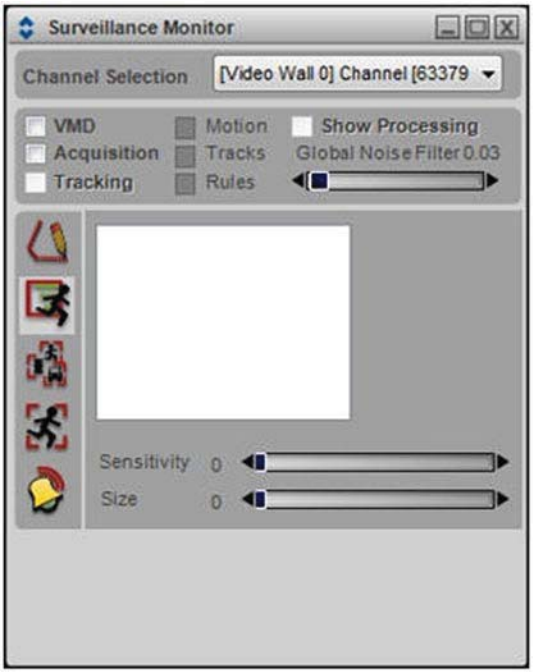
The user-defined areas can be shown or hidden by clicking on the "**Show Areas**" checkbox.

A user-defined area can be removed by selecting it in the areas list and clicking on the "**Remove**" button.

The region of interest can be shown or hidden by clicking on the "**Show ROI**" checkbox. Its size and position can be set via the "**ROI Size**" and "**ROI Position**" sliders.

5.19.2 VMD

The VMD section contains the controls needed to manage the video motion detection regions and parameters:



The area parameters can be modified by selecting an area in the VMD areas list and using the sliders to set the adequate values.

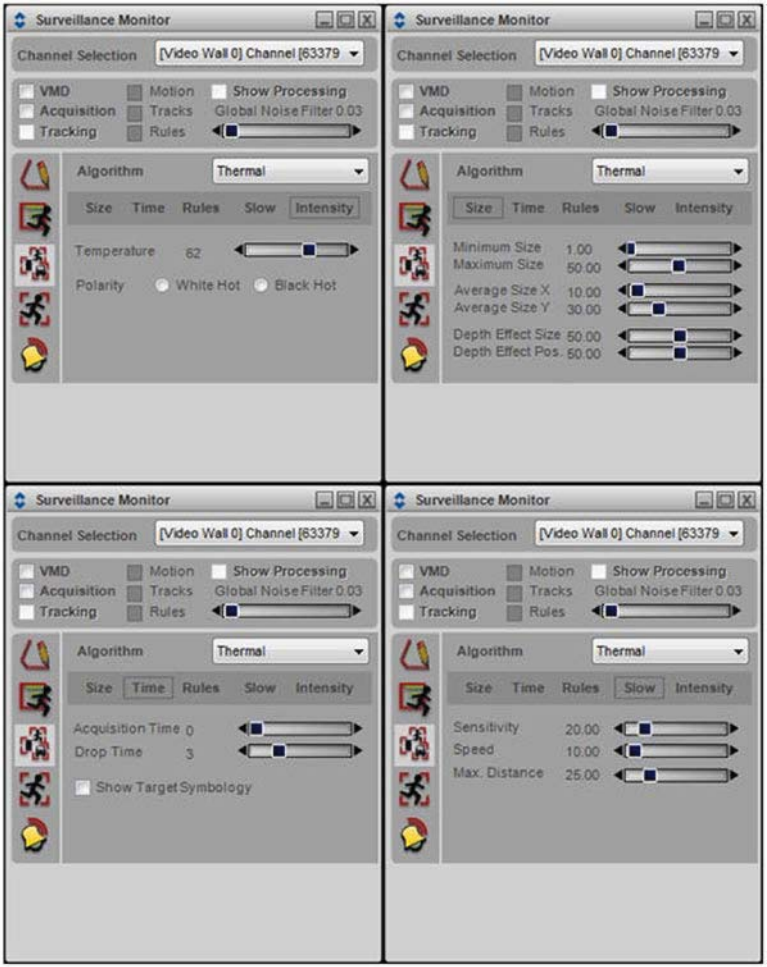
5.19.3 Acquisition

The acquisition section contains the controls needed to manage the target acquisition algorithms and the rules engine.

5.19.3.1 Algorithms Setup

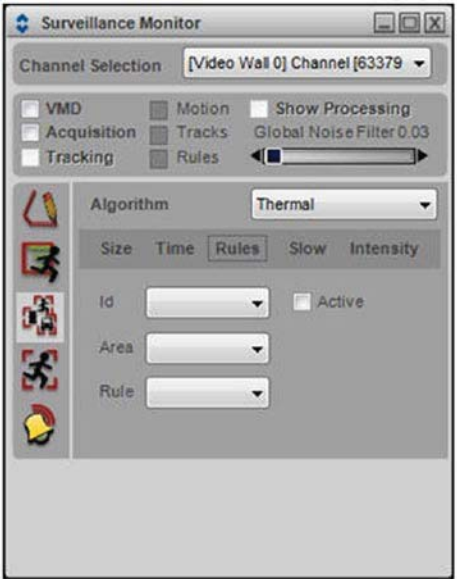
The acquisition algorithm can be selected in the "**Algorithm**" drop down list.

The "**Size**", "**Time**", "**Slow**" and "**Intensity**" sections allow setting the algorithms parameters:

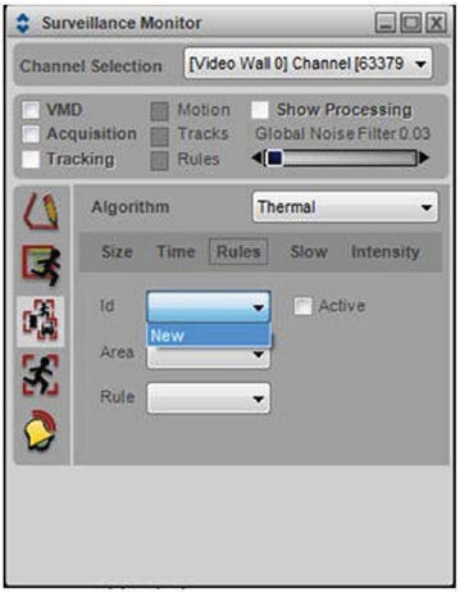


5.19.3.2 Rules Engine Setup

The rules engine is managed via the "**Rules**" section:

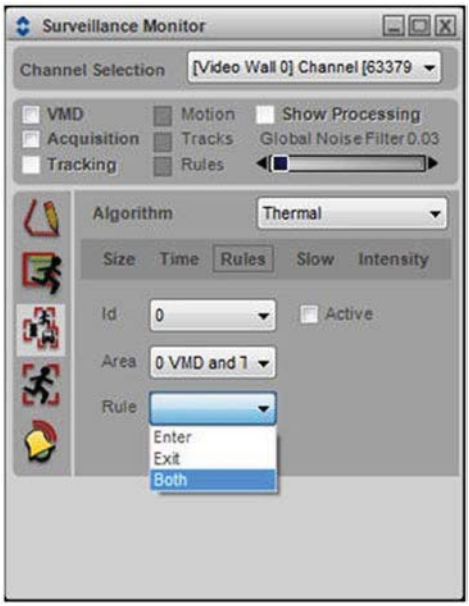


The first step to create a new rule is to create a new rule identifier:

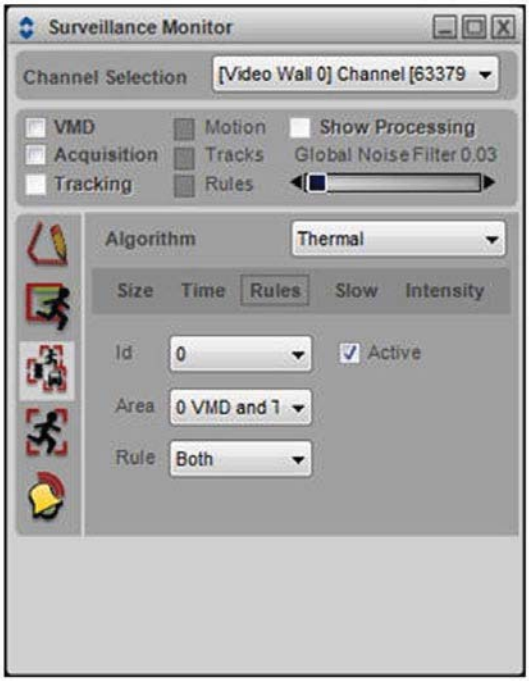


Once the new rule identifier is assigned, the area the rule is associated with must be selected:

The last rule configuration step is to select the rule trigger:



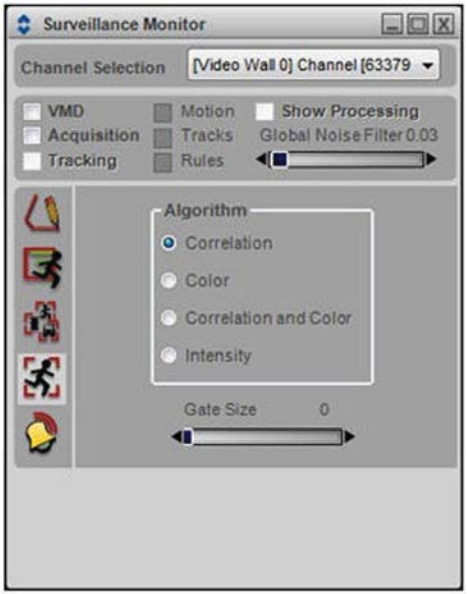
Once the rule setup is complete, it can be activated or deactivated by clicking on the "**Active**" checkbox:



Any previously configured rule can be modified by selecting its identifier in the "**Id**" drop down list and modifying its parameters.

5.19.4 Tracking

The tracking section contains the controls needed to manage the video tracker:



The tracking algorithm can be selected via the "**Algorithm**" group box radio buttons:

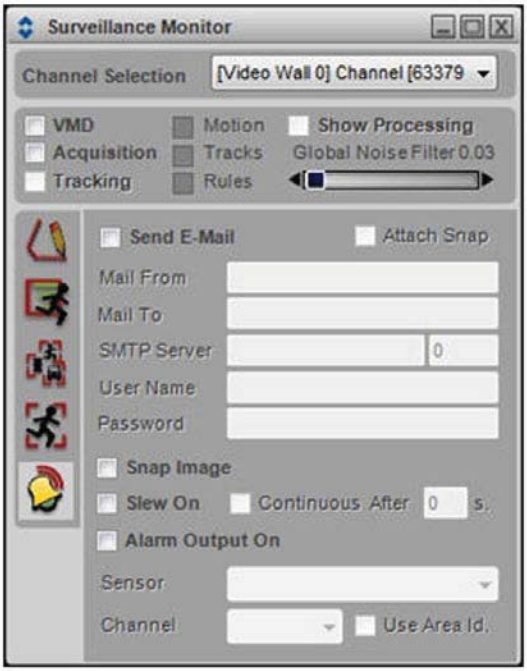
- **Correlation Algorithm**: looks for a contour (shape) pattern in the image.
- **Color Algorithm**: looks for a color pattern in the image.
- **Correlation and Color Algorithm**: combines both of the above.
- **Intensity Algorithm**: looks for targets over a threshold in the image (can be seen as a temperature threshold when working with an IR). Applies only to IR cameras.

The tracker can be enabled by **Shift+clicking** on the video while the "**Aim**" cursor mode is enabled or by double-clicking in the video window. To disable the video tracker, just click on the video once.

The "**Gate Size**" scroll allows setting the algorithm's gate size. The gate size sets the size of the area from where the algorithm will get the pattern it will try to follow.

5.19.5 Alarms

The alarms section contains the controls needed to manage the actions to be taken when a video alarm is triggered:

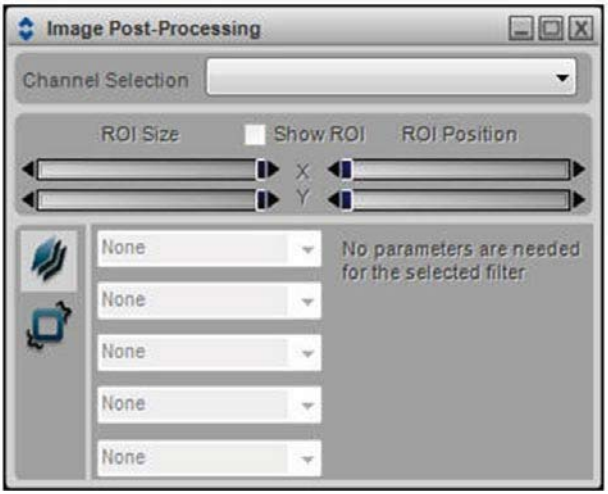


The following actions can be enabled to be performed on the event of an alarm being triggered:

- "**Send E-Mail**": sends an e-mail using the configured accounts settings.
- "**Snap Image**": stores a snapshot in the media folder. This snap can be attached to the sent e-mails by enabling the "Attach Snap" check box.
- "**Slew On**": commands an associated sensor to aim at the alarm source.
- "**Alarm Output On**": enables an associated I/O sensor output. For more information on the surveillance monitor parameters, please refer to **Appendix D**.

5.20 Image Post-Processing

The image post-processing module allows managing the image filters and the electronic stabilization. To view the post-processing module, click the "**View**" button of the toolbar and select "**Image Post-Processing**":



The image post-processing module manages the selected video channel. The channels can be selected via the channel selection drop down list, or by clicking on the adequate video wall video player.

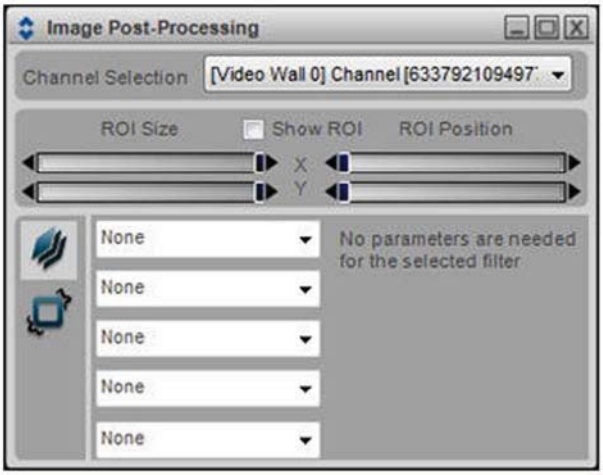
NOTE: To be selectable, the video channel must have the video post-processing option (VPP) enabled beforehand.

The main features are managed with the common controls placed right below the channel selection drop down list.

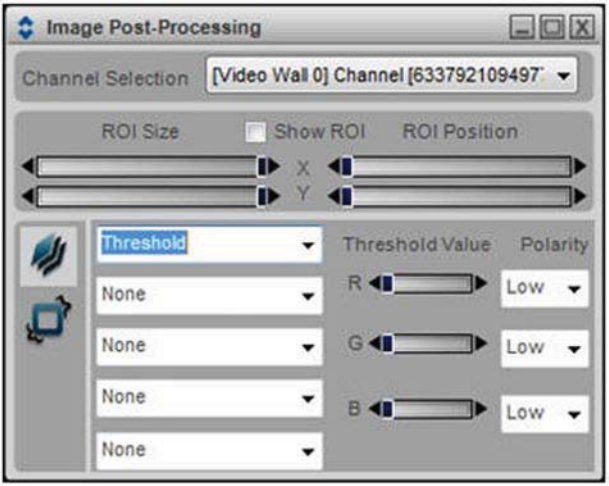
The specific features controls are placed in the corresponding sections. The sections can be accessed by clicking on the sidebar icons.

5.20.1 Filters

The filters section contains the controls needed to manage the image filters layers and parameters:

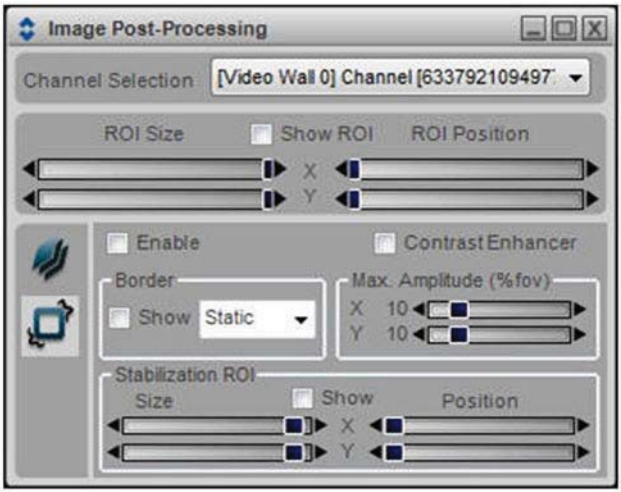


If parameters are applied to the selected filter, these will be shown beside the filters drop down list:



5.20.2 Stabilization

The stabilization section contains the controls needed to manage the electronic stabilization (eStab) and its parameters:

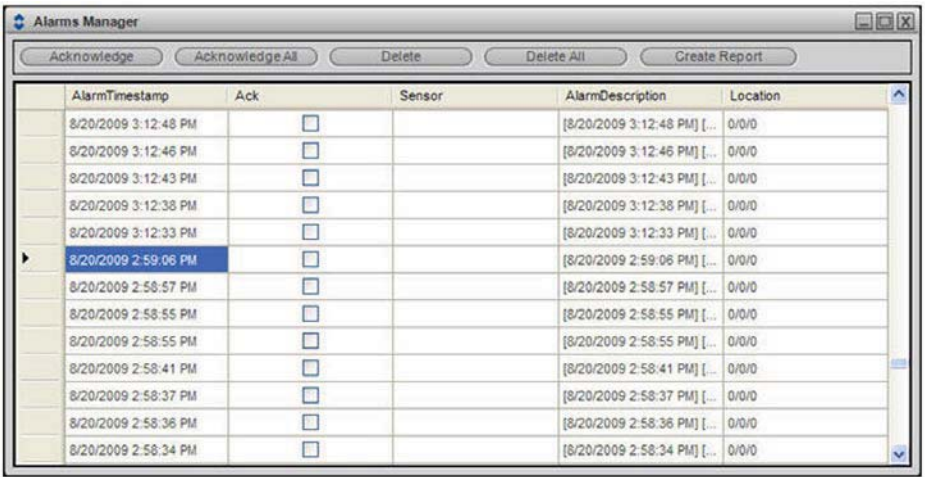


The "Border," "Max. Amplitude (%fov)" and "Stabilization ROI" group boxes, as well as the "Contrast Enhancer" check box, allow setting the electronic stabilization parameters.

The "**Enable**" checkbox is used to enable and disable the stabilization.

5.21 Alarms Manager

The alarms management module allows for acknowledging, and deleting alarms:

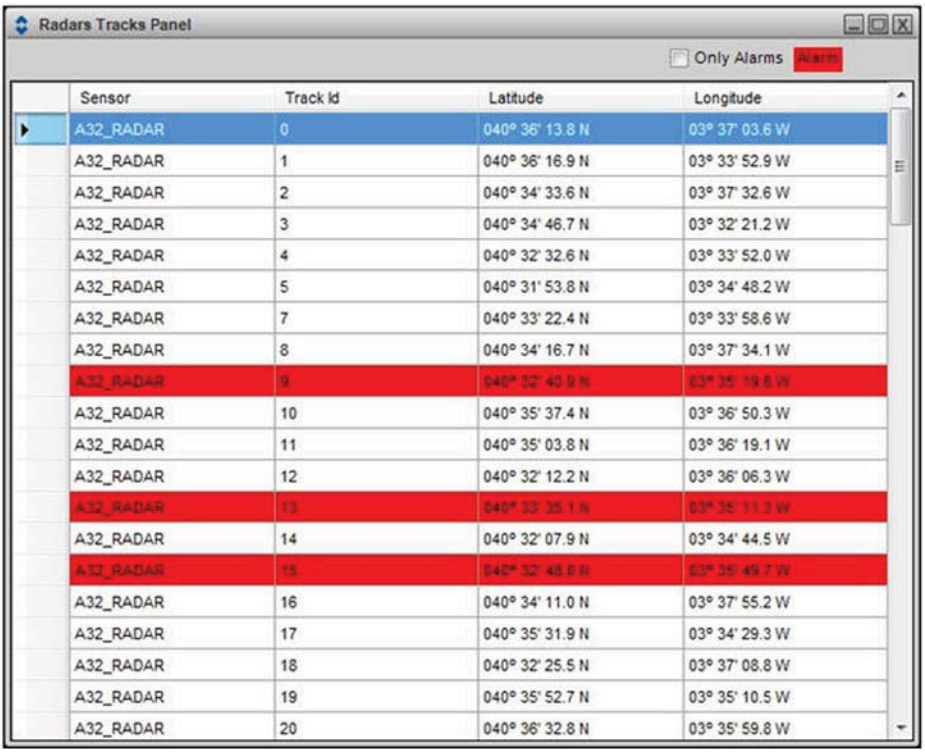


The alarms are stored in a database file in the log folder. Any change will immediately affect the alarms database file. This file can be exported by clicking on the **Create Report** button. The file is exported as an .XML file, which can be opened with several applications, e.g. Microsoft Excel™.

NOTE: The Alarms database is automatically backed up in an XML file and the running database is cleared every 1000 alarm events.

5.22 Radars Tracks Panel

The Radars Tracks panel lets the user monitor the radar tracks status and acknowledge the alarms initiated by those tracks. To display the Radars Tracks panel, click the "**View**" menu button and select "**Radars Tracks Panel**":



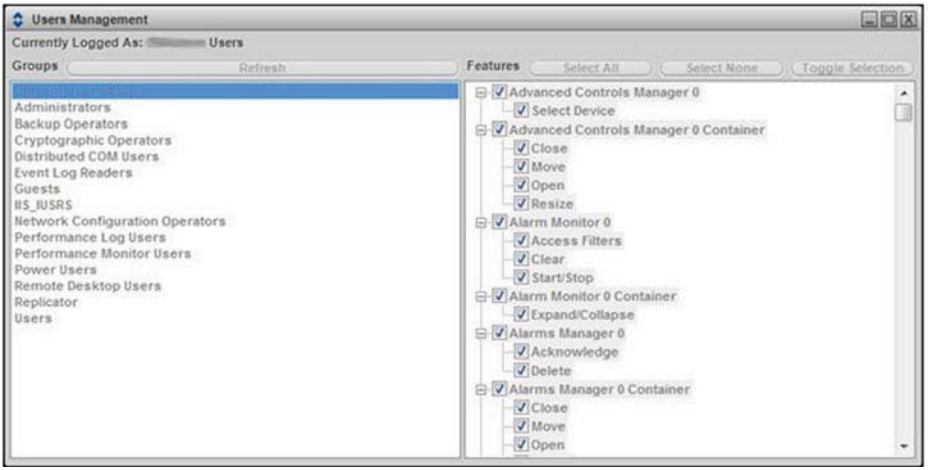
Sensor	Track Id	Latitude	Longitude
A32_RADAR	0	040° 36' 13.8 N	03° 37' 03.6 W
A32_RADAR	1	040° 36' 16.9 N	03° 33' 52.9 W
A32_RADAR	2	040° 34' 33.6 N	03° 37' 32.6 W
A32_RADAR	3	040° 34' 46.7 N	03° 32' 21.2 W
A32_RADAR	4	040° 32' 32.6 N	03° 33' 52.0 W
A32_RADAR	5	040° 31' 53.8 N	03° 34' 48.2 W
A32_RADAR	7	040° 33' 22.4 N	03° 33' 58.6 W
A32_RADAR	8	040° 34' 16.7 N	03° 37' 34.1 W
A32_RADAR	9	040° 32' 40.9 N	03° 35' 19.6 W
A32_RADAR	10	040° 35' 37.4 N	03° 36' 50.3 W
A32_RADAR	11	040° 35' 03.8 N	03° 36' 19.1 W
A32_RADAR	12	040° 32' 12.2 N	03° 36' 06.3 W
A32_RADAR	13	040° 33' 35.1 N	03° 35' 11.2 W
A32_RADAR	14	040° 32' 07.9 N	03° 34' 44.5 W
A32_RADAR	15	040° 32' 48.6 N	03° 35' 49.7 W
A32_RADAR	16	040° 34' 11.0 N	03° 37' 55.2 W
A32_RADAR	17	040° 35' 31.9 N	03° 34' 29.3 W
A32_RADAR	18	040° 32' 25.5 N	03° 37' 08.8 W
A32_RADAR	19	040° 35' 52.7 N	03° 35' 10.5 W
A32_RADAR	20	040° 36' 32.8 N	03° 35' 59.8 W

If the "**Only Alarms**" check box is checked, only the tracks in alarm status will be listed.

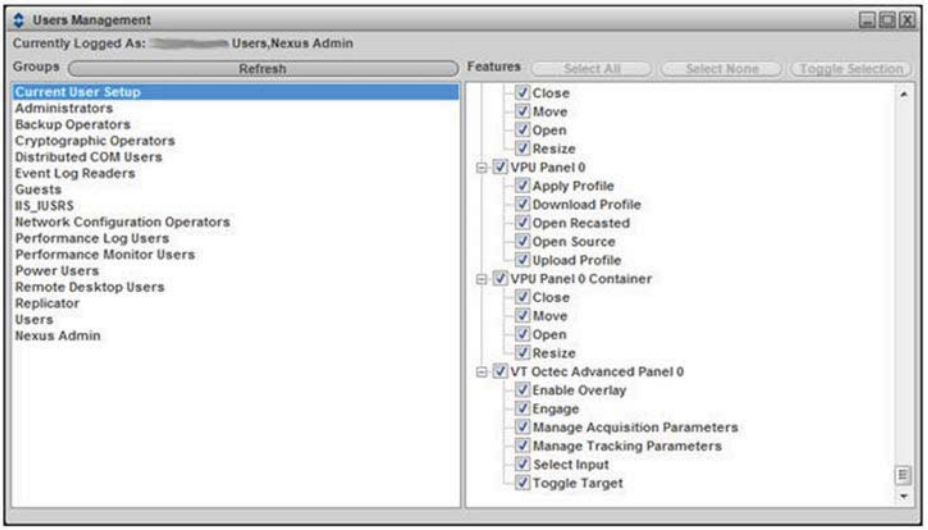
Double-clicking on a track will acknowledge its alarm.

5.23 Users Management

The Users Management module lets the Administrator set the user groups application permissions and restrictions. The Users Management module can be displayed by clicking on the "**View**" button of the toolbar and selecting "**Users Management**":



By default the Users Management module is disabled leaving all the features in FSM enabled for any given user. To enable the Users Management module, the user must first create a Windows group on the local PC titled "**Nexus Admin**." Once this group exists, members of the Nexus Admin group will be allowed to configure other user groups permissions and restrictions.



NOTE: Members of the Nexus Admin group will always have all available FSM features enabled.

Selecting a group in the groups list will display the current permissions on the features list.

The available groups can be updated by clicking on the "**Refresh**" button.

The features list displays the available application controls and the manageable features in each control.

Un-checking a feature element will disable the corresponding feature while un-checking a control element will disable all the features of the corresponding control for that particular group.

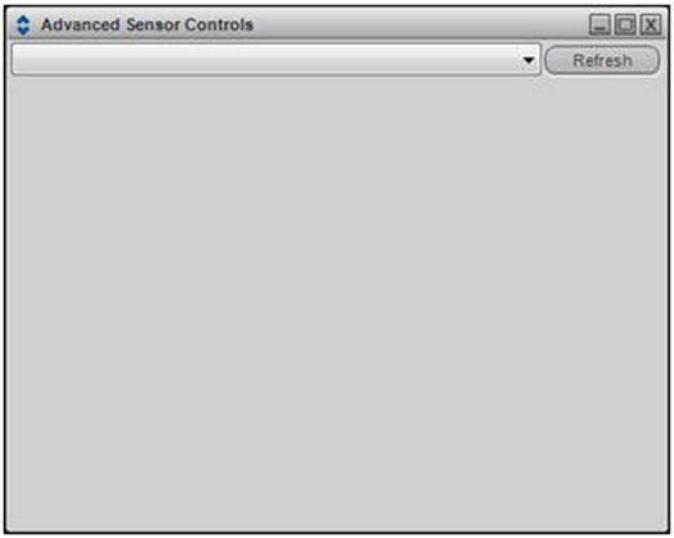
While the Users Management module is open, the permissions of the selected group will be applied in the application. This way an administrator can test the set permissions without having to log back in as another user.

The "**Current User Setup**" group displays the permissions of the current user. When this element is selected, permissions cannot be modified. In order to modify the permissions of the current user, the permissions of the groups the user belongs to must be set.

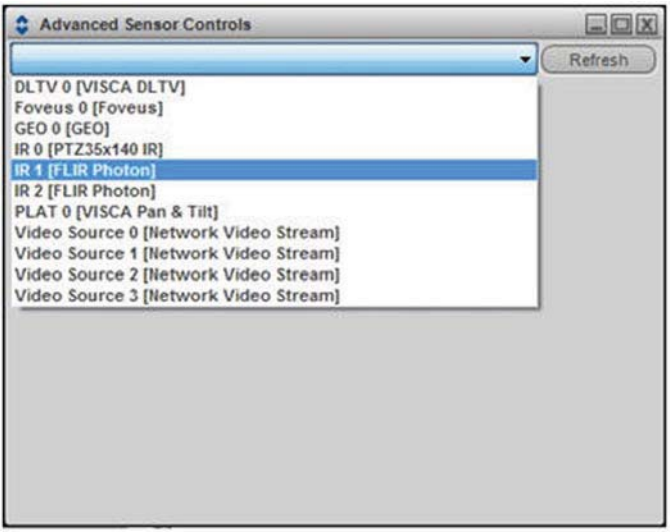
Users belonging to more than one group will share the permissions of all the groups to which the user belongs. For more information please refer to **Appendix B: Setting up User Privileges.**

5.24 Advanced Sensors Controls

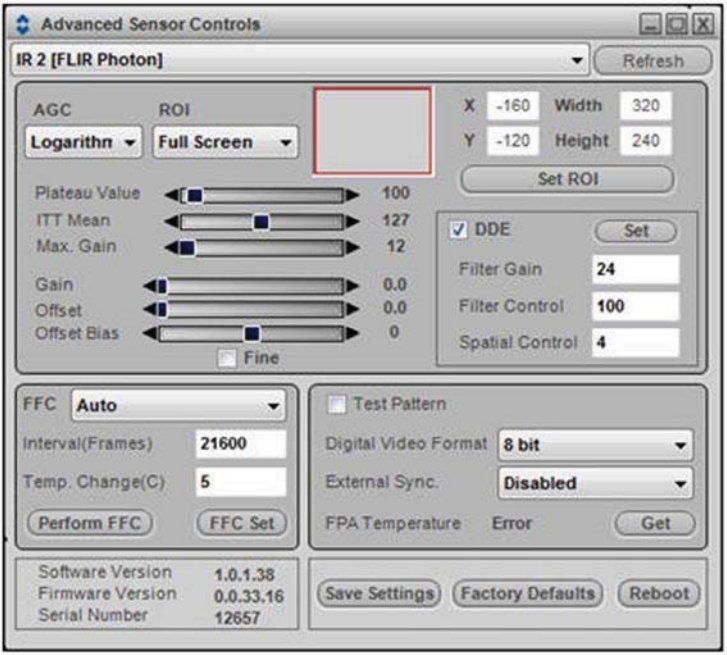
The advanced controls manager allows accessing the devices advanced features. The advanced controls manager can be displayed by clicking on the "**View**" button and selecting "Advanced Sensors Controls":



When a server is set as active, the drop down list is filled with its devices:

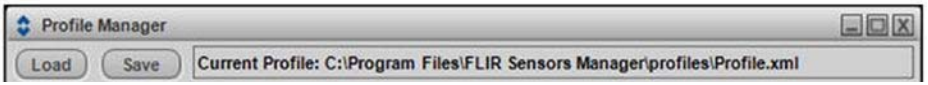

Advanced Sensor Controls
Refresh
DLTV 0 [VISCA DLTV]
Foveus 0 [Foveus]
GEO 0 [GEO]
IR 0 [PTZ35x140 IR]
IR 1 [FLIR Photon]
IR 2 [FLIR Photon]
PLAT 0 [VISCA Pan & Tilt]
Video Source 0 [Network Video Stream]
Video Source 1 [Network Video Stream]
Video Source 2 [Network Video Stream]
Video Source 3 [Network Video Stream]

When a device is selected, its Advanced Sensors Controls panel is shown, if available:



5.25 Profile Manager

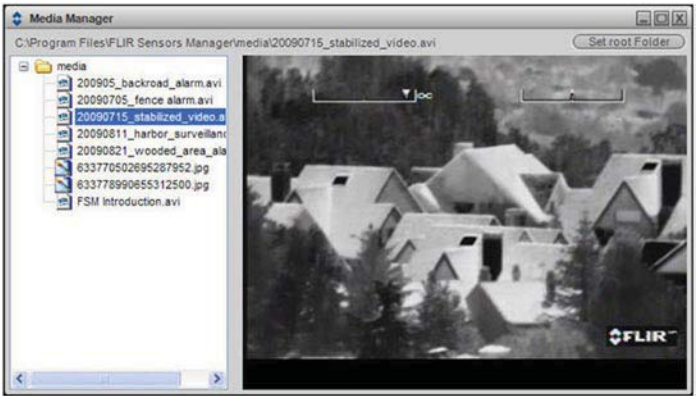
The Profile Manager lets the user load and save profiles. Profiles are often used hand in hand with the User Management module enabling low level users to load specific profiles with only certain windows and controls shown. To display the profile manager, click the "**View**" menu button and select "**Profile Manager**":



5.26 Media Manager

The Media Manager lets the user see a list of files stored in the Media folder, i.e snapshots saved from video, typically located at **C:\Program Files\FLIR Sensors Manager\media**, although it can be any other folder the user selects. If the user wishes to use another folder to store the media, click the **Set Root Folder** button to select it as the default folder.

Any item can be previewed by clicking on the list displayed on the left window pane.



5.27 Sounds Manager

The Sounds Manager allows the user to assign specific sound files to application events (currently to Alarms and Video Wall events). In the example below, the user is assigning a sound to the Alarm function by selecting Alarm, then clicking on the drop down arrow to select a sound file from the loaded files. To add a sound file to the sounds drop down list press the "**Import Sound File**" button to browse to and then import a sound file from another folder on the local system. FLIR Sensors Manager supports .wav and .mp3 files.

APPENDIX A. Sensor Network Configuration

1 Changing the Client's (Host PC's) IP Address

1.1 Windows Vista & Windows 7

1. Navigate to Network & Sharing Center located in the Control Panel/Network & Internet/ Network & Sharing Center under the Start menu of the PC.
2. Click on the Local Area Connection Link (or appropriate source) for the internet connection to the network. The Local Area Connection window will appear then select the Properties button.
3. Once the Properties window opens. Select Internet Protocol Version 4 (TCP/IPv4) from the list. Then select the Properties button.
4. Select the Use the following IP address: tab. Under the IP address: tab write in the IP address of the Nexus Server then change the last digits to be some other number than the Server's IP ending digits; between 0-255.

Example:
Nexus Server's IP Address: 192.168.250.101
PC's IP Address: 192.168.250.55
Then in the Subnet mask: "255.255.255.0".

1.2 Windows XP

1. Navigate to Network Connections located in the Control Panel under the Start menu of the PC.
2. Right click on the LAN or High-Speed Internet connection being used to communicate with the Nexus Server and select Properties.
3. Next select the Internet Protocol (TCP/IP) tab and press the Properties button directly below the TCP/IP tab, as seen in figure 17 below.
4. Select the Use the following IP address: tab. Under the IP address: tab write in the IP address of the Nexus Server then change the last digits to be some other number than the Server's IP ending digits; between 0-255.

Example:
Nexus Server's IP Address: 192.168.250.101
PC's IP Address: 192.168.250.55
Then in the Subnet mask: "255.255.255.0".

Note: These instructions are for a typical installation. Individual installations may require additional network settings to be changed. If in doubt, contact your network administrator Setting up Users and Workgroups

APPENDIX B. Setting up Users and Workgroups

1 Setting up Users and Workgroups

When first starting the application all features are enabled. A user may wish to set up user group restrictions to control the functionality, look, and feel of FSM for some users.

The FSM application uses the Microsoft Windows™ user group infrastructure to manage users. Users can then be assigned privileges which determine their level of access and control of the application using FSM's User Management feature. The user group that enables the User Management feature is the Nexus Admin group.

Nexus Admin - Once created, members of this group will be allowed to use the User Management feature in FSM, and in doing so can create restrictions for any other groups. This allows restrictive rights to users who are not members of the Nexus Admin group.

NOTE: The following MS Windows versions do not provide groups management and the permissions management will be disabled for users running any of the following:

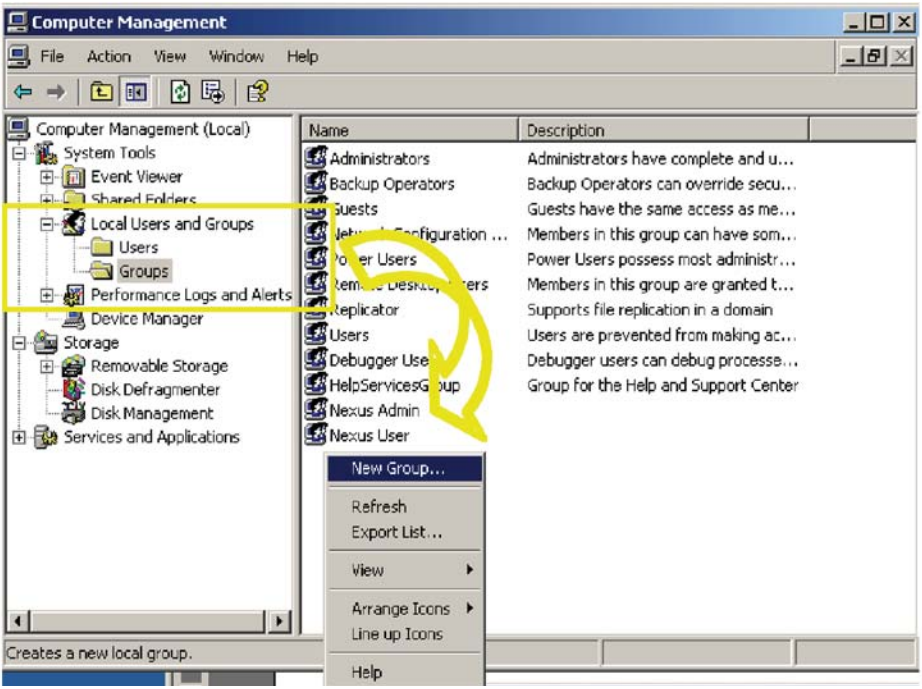
- Windows XP Home Edition
- Windows Vista Starter
- Home Basic and Home Premium

For Windows XP setup instructions, see Section 1.1
For Windows Vista and 7 setup instructions, see Section1.2.

1.1 Creating Accounts (Windows XP Professional)

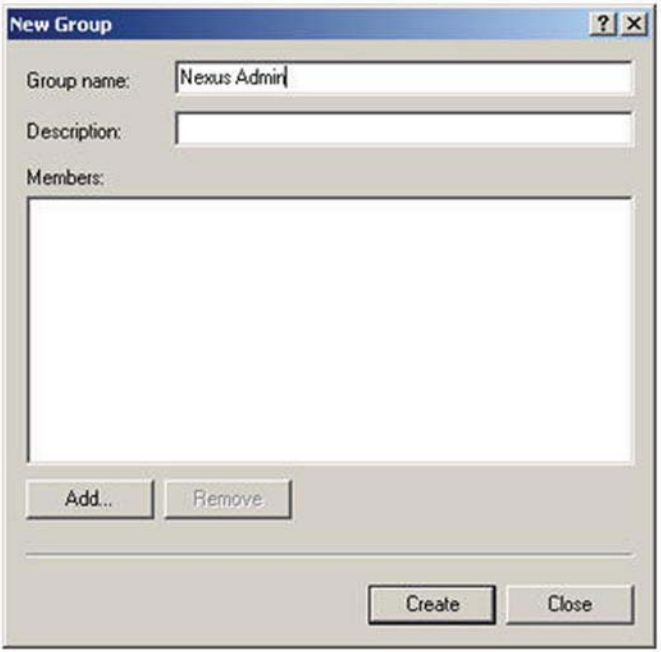
1. Right click on **My Computer**, located under the **Start** menu or on the desktop of the PC, and select **Manage** as shown in the figure below:

2. Located on the left hand side is a drop down tab; select the **System Tools> Local Users and Groups> Groups** tab. Add a new group to the **Groups** tab by right clicking below the groups, located on the right hand side of the **Computer Management** window, and select **New Group**…



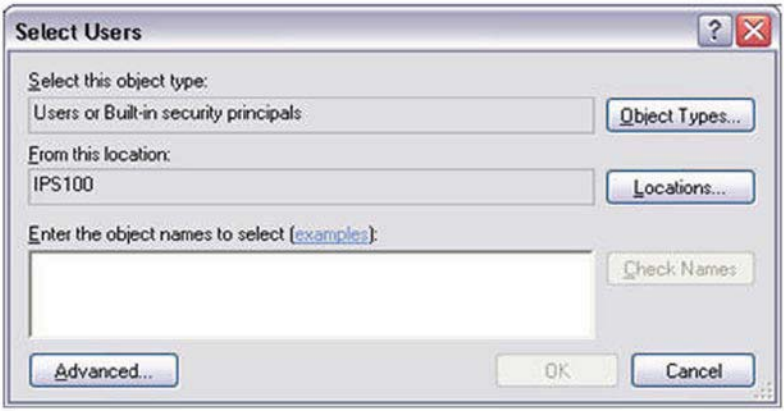
NOTE: "New Group…" can also be selected by clicking the Action tab located in the upper left hand corner of the window.

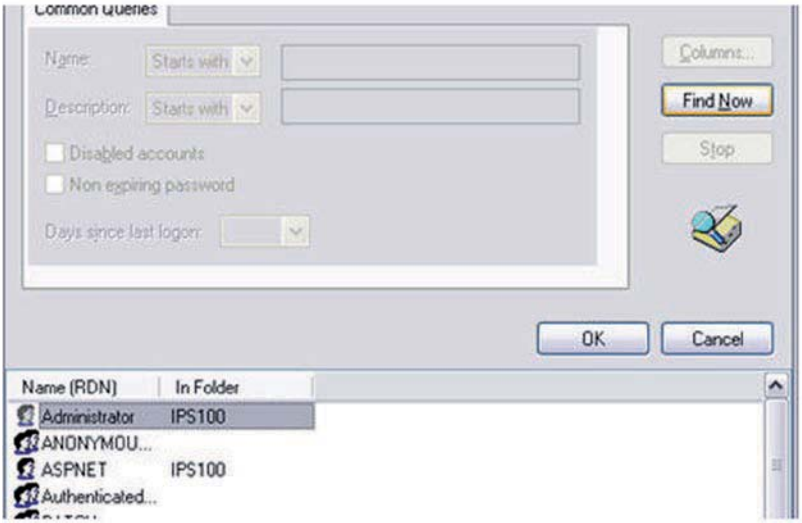
3. In the **Group name** field type "**Nexus Admin**" then click **Create** (please note that the name is case sensitive and that it must be typed exactly this way). This group is for the users who need administrative rights in controlling the User Management feature in FSM. Once the groups have been created, click **Close** to exit the **New Group**.



NOTE: If a user is not part of the "Nexus Admin" group, this user is considered a'Basic User' (Resitricted Access in FLIR Sensors Manager).

4. Then select the **Add**… button in the bottom left of the **New Group** window. Then select the appropriate users who need administrative rights regarding setting FSM's User Management control. To search for users select the **Advanced**… button. Then press the **Find Now** button and select a user from the generated list.





1.2 Setting up User Groups (Windows Vista / 7 Professional)

1. Open Microsoft Management Console by clicking the **Start** button, typing **mmc** into the **Search** box, and then pressing ENTER. If prompted for an administrator password or confirmation, type the password or provide confirmation.
2. In the left pane, click **Local Users and Groups.**
3. Double-click the **Groups** folder.
4. Click **Action**, and then click **New Group.**
5. Type a group name and a description.
6. Click **Add**, and then type the name of the user account.
7. Click **Check Names**, and then click **OK**.
8. Click **Create**.

1.2.1 Create a New User Account

1. Open Microsoft Management Console by clicking the **Start** button, typing mmc into the **Search** box, and then pressing ENTER. If prompted for an administrator password or confirmation, type the password or provide confirmation.
2. In the left pane of Microsoft Management Console, click **Local Users and Groups.**
3. Click the **Users** folder.
4. Click **Action**, and then click **New User.**
5. Type the appropriate information in the dialog box, and then click **Create**.
6. Once the user accounts are finished, click **Close**.

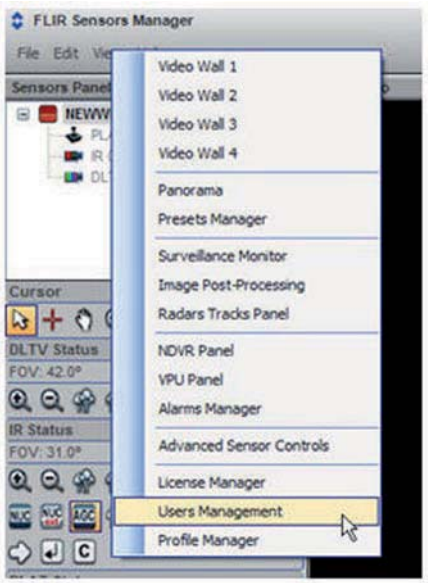
1.2.2 Add a User Account to a Group

1. Open Microsoft Management Console by clicking the **Start** button, typing **mmc** into the **Search** box, and then pressing ENTER. If prompted for an administrator password or confirmation, type the password or provide confirmation.
2. In the left pane of Microsoft Management Console, click **Local Users and Groups.**
3. Double-click the **Groups** folder.
4. Right-click the group where the user account is to be added, and then click **Add to Group**.
5. Click **Add**, and then type the name of the user account.
6. Click **Check Names**, and then click **OK**.

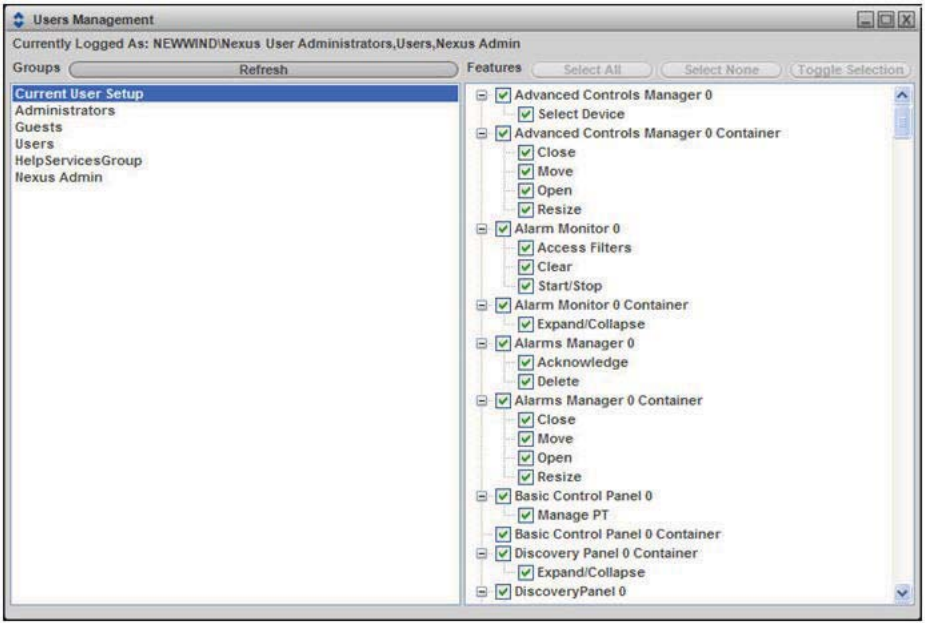
1.3 Setting up User Privileges

FSM allows a Nexus Admin (FSM Administrator) to set up privileges/restrictions for different users. This is incredibly useful when a user wants to prevent an operator from making changes to a particular set up, or if you want them to run the application with only certain functions enabled.

To access the **Users Management** window, click on View/Users Management:



The Users Management window displays. Select the user or group then select the functions that will be accessible to that user in the right window panel.



The user can use the Features buttons to "**Select All**", "**Select None**" or "**Toggle Selection.**" Alternatively, the user can pick and choose which functions to assign to a particular user group.

Please note that "Current User Setup" is not an actual group but a view of the privileges of the current user, taking into account the permissions of the groups to which the user belongs.

APPENDIX C. Electronic Stabilization

1 Introduction

This appendix describes the electronic stabilization (eStab) functionality included in FLIR Sensors Manager. **eStab is available only in the Pro License version.**

2 Hardware Requirements

CPU power requirements for eStab will depend on the format (compressed, uncompressed) and input resolution of the video and the number of post processing filters added by the user.

As a guideline, an Intel P4 3Ghz Hyperthreading processor with a high performance video card will be capable of decompressing and displaying an MPEG Full-4CIF video with eStab, with no other post-processing filters added. A Pentium Core 2 Duo 2Ghz will be able to open a Full-4CIF video with eStab and a median filter, or two or more of the other available filters.

NOTE: 4CIF resolution is 704 x 480 for NTSC systems and 704 x 576 for PAL systems.

The graphics card (VGA) must be DirectX 9 compatible and have no less than 128 MB of dedicated RAM. Several modern chipsets from Nvidia™ and ATI™ have been tested with good results.

3 eStab Application Guidelines

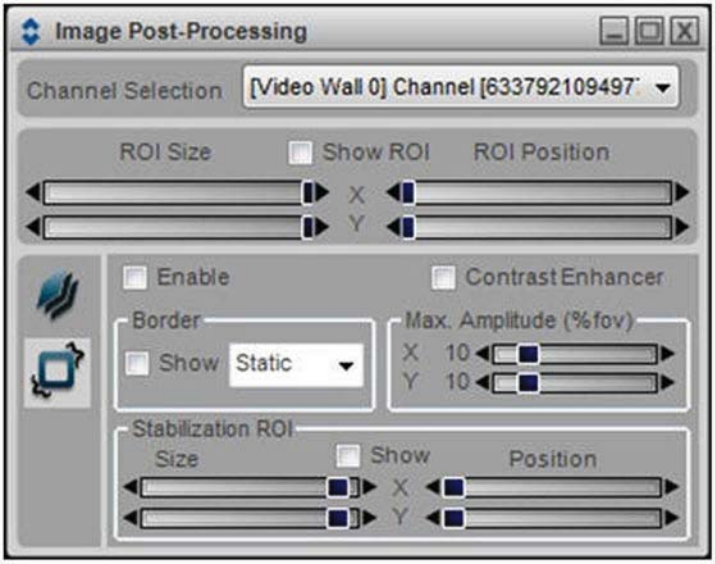
3.1 Principle of Operation

There are two ways to use eStab: fully automatic mode and semi-automatic mode. The operating mode is selected by choosing the Border mode. If Border mode is set to Dynamic the algorithm will automatically adjust the stabilization parameters to the vibration schema in the image. In this case the Max amplitude sliders are ignored.

If Border mode is set to Static, then the Max amplitude sliders will have to be manually adjusted by the user to match the vibration's dynamic range on the video.

3.2 eStab Control Panel in FLIR Sensors Manager.

To adjust the Stabilization parameters in FLIR Sensors Manager click **View>Image Post-Processing>eStab** tab. The following image shows the layout of the different controls in the current version of FLIR Sensors Manager:



3.3 Setting up the Stabilization ROI

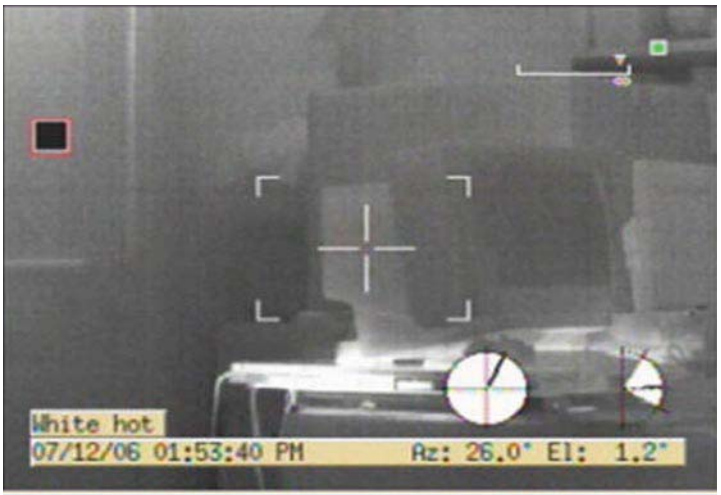
Ideally, no camera symbology should be displayed on the video. If this is not possible, the Stabilization ROI can be used to exclude any static text or logo from the computing area, in order to optimize the performance of the eStab algorithms.

To adjust the Stabilization ROI click **View>Image Post-Processing>eStab tab**. The Stabilization checkbox must remain unchecked while adjusting the stabilization ROI.

Any black/blank border will be excluded from the computing area (left out of the stabilization ROI), in order to allow enough information for the algorithm to work properly. The Stabilization ROI can be hidden once setup is completed. eStab can now be enabled by clicking on the **enable** check box.

3.3.1 Stabilization Example 1

This video shows the most adverse situation for eStab. Static symbology and black border are still present in the image. The first step should be to remove or minimize the static camera symbology on the image (declutter).

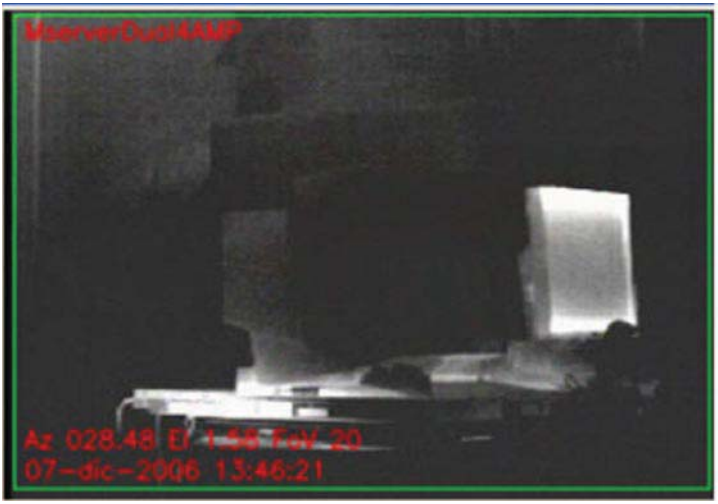


3.3.2 Stabilization Example 2

In this picture the camera symbology has been removed and the stabilization ROI is adjusted to avoid the black border on the left. Video contrast is very low, making this image a good candidate to enable the Contrast Enhancement feature. Doing this will not show any difference in the displayed video but will highly improve the performance of the eStab algorithm.

3.3.3 Stabilization Example 3

In this picture OSD symbology has been added using **Edit->Preferences->OSD** in FLIR Sensors Manager. These symbols do not affect eStab since they are added after the processing filters, and can be used to restore the information that is missing when the camera symbology was removed. A different AGC algorithm has been selected to improve the camera's contrast.



3.4 Adjusting Amplitude Parameters

If eStab is set to fully automatic mode (Border mode: Dynamic), the settings in the amplitude sliders are ignored.

If eStab is in semi-automatic mode (Border mode: Static) the amplitude sliders must be set to match the vibration magnitude on x and y axis of the video.

To make these adjustments, **Border Show** should be disabled. This is necessary in order to be able to see the black border around the image when it is being adjusted. The width and height of this border has to be greater in pixels than the maximum vibrations to damp on the image, on x and y.

Start on the maximum (sliders to the right) and start decreasing the value until the balance between image size/stillness of the image is optimum. Notice that amplitude can be adjusted independently for X and Y axis.

4 Additional Settings

4.1 Show Border

This setting can be used when eStab is in semi-automatic mode (Border mode: Static) and the User cannot afford missing any portion of the field of view while the image is being stabilized (maximum situational awareness). It is also useful to confirm that stabilization is working properly.

4.2 Contrast Enhancer

On low contrast situations, especially on IR cameras, a contrast boost may be necessary for eStab to deliver optimum performance. This is achieved by activating the Contrast Enhancer checkbox.

Enabling contrast enhancement will not show any difference in the displayed video but will highly improve the performance of the eStab algorithm. Contrast enhancement is never recommended for stabilizing DLTV (color) video images.

5 Troubleshooting and Limitations

5.1 Integration Time

eStab works with periods below integration times. If the period of the vibration frequency is shorter that the integration time used in the detector of the camera, eStab will be considerably less effective.

5.2 CPU Usage

If the requirements specified under hardware requirements are met, the CPU load used by FLIR Sensors Manager should remain always under 80%. If blocking or sputtering artifacts are shown in the video, the CPU utilization graph should be checked.

In order to lower the CPU load the video size can be reduced in the encoder or frame grabber. In an overload situation any additional post processing filters that may have been inserted (VMD, Tracker, etc) should be removed in order to allow the eStab algorithm to work properly.

5.3 Limitations

The following video or image quality situations may reduce eStab performance:

5.3.1 Noisy Video

Gaussian noise patterns, like the one showed on the following sample image, will considerably affect the performance of the eStab algorithms.

5.3.2 Very Low Resolution Video

This situation is common when the input resolution is CIF and the electronic zoom is enabled in the camera. The effective resolution in these cases is calculated as: (input resolution)/ eZoom multiplier factor.

APPENDIX D. Setting up the Surveillance Monitor

1 Introduction

The Video Surveillance Monitor offers a set of tools to allow the user to take full advantage of the surveillance capacity of their sensor network system. This Appendix shows how to set up the surveillance system using the VMD (Video Motion Detection) algorithm, the Target Acquisition algorithm, or a combination of the two.

The Video Surveillance Monitor allows the user to create specific surveillance areas on the monitor image, letting the user set specific trigger alarms based on detected movement on the video image.

2 Items Required

Any Nexus compliant camera or FLIR Sensors Manager's compliant video source, e.g., video stream, DirectX compatible video capture device (frame grabber), or file (ASF/AVI file, etc.).

3 Setting up the Environment

This section is based on the following assumptions:

- The cameras are correctly configured and the video is displayed flawlessly.
- The FLIR Sensors Manager Pro License is loaded (which enables the video post processing functions).

4 Important Concepts for VMD (Video Motion Detection) and Target Acquisition

VMD is the acronym for Video Motion Detection. It consists on an algorithm that is able to detect motion inside predefined "**VMD**" or "**VMD & Track**" areas in the video channel. When there is pixel difference detected inside any of these predefined areas, a VMD alarm is triggered.

ROI (Region of Interest): Defines the region of the video that will be analyzed by any of the image post processing algorithms. Everything inside the ROI will be processed, whereas everything outside of it will be ignored by the surveillance algorithms. The scroll bars of the ROI section can adjust the size and the position of the ROI as well as making it "Visible" or not on the video window. This concept is common for VMD, Target Acquisition and all the other image post processing tools.

AREAS: Areas are portions of video on which the intelligent video algorithms will create motion alarms (VMD) or entering/exiting alarms (Target Acquisition). There is also a special area type (Blanking) where the intelligent video algorithms are disabled. It is possible to draw several areas of the same or of different types on the same video channel. The following area types are supported:

Type of Area	Applied to	Consists of
Blanking	Acquisition	A polygon within which the acquisition engine is disabled
VMD	VMD	A polygon within which the VMD is active
Acquisition	Acquisition	A polygon within which the rules engine is active
VMD and Acquisition	VMD and Acquisition	A polygon within which both VMD and rules engine algorithms are active
Wire	Acquisition	An open, multi-segment line over which the rules engine algorithm is active

RULES: A rule is a set of conditions that may trigger an alarm. It is possible to assign one or more rules to each defined area. Depending on the area type, these rules may be:

Type of area	Possible rules
VMD	No rules
Acquisition	Enter, Exit, Both*
VMD and Acquisition	Enter, Exit, Both
Wire	Right → Left, Left → Right, Any Crossing**

*Object detected upon entering, leaving, or entering and leaving selected area
**Object detected upon crossing right to left, left to right or when crossing the selected area in any direction

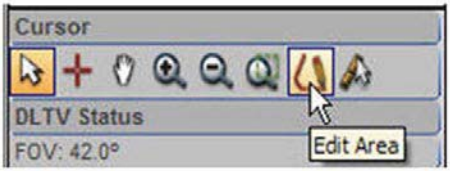
Global Noise Filter: This is a statistical filter that discriminates between real changes on the image and the inter-frame differences generated by analogical video signal noise, or by the video compression algorithms, or by noise in the background. Lower values should be used for high compression or noisy images or backgrounds, and higher values for good quality, low noise video. The default value (0.03) has been proved to be adequate for most situations. **Please note that this setting affects both VMD and Target Acquisition's Motion algorithm.**

5 Setting up a Surveillance System Using VMD

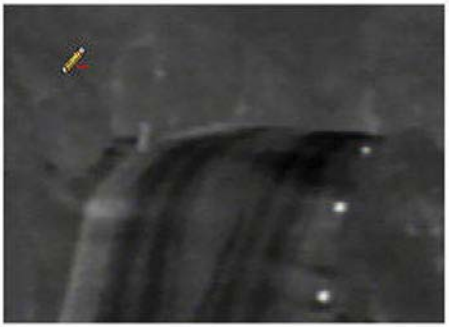
To set up a surveillance system that takes advantage of the VMD algorithm, the user needs to define a surveillance area; for this use the "Area Edit" function.

5.1 Area Edition

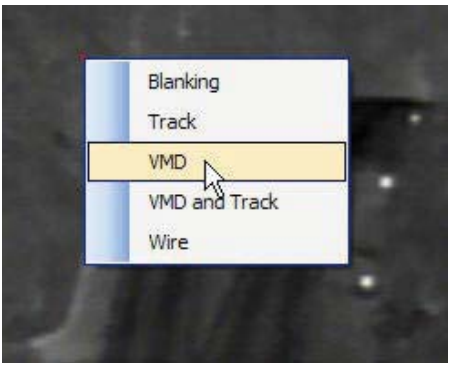
The area edit function allows the user to create specific surveillance areas on the screen. This function allows the creation of zone where movement can trigger a preset alarm, as could be the case in a zone close to a gate, or along a fence. The area drawn is a polygon and can accommodate any shape the user wants. For simplicity, in this example we are using a four-sided box.



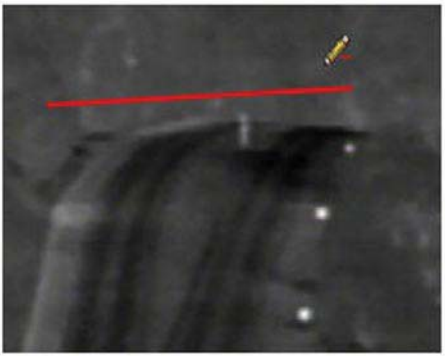
To begin, click the **Edit Area** button.



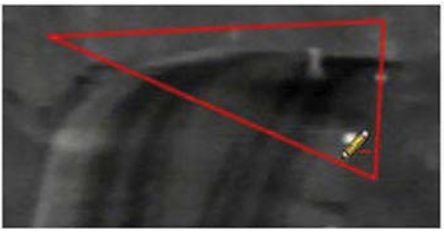
The cursor has now turned into a pen. Position the cursor in the desired beginning location, left click to select the area type and place the first point in the polygon area.



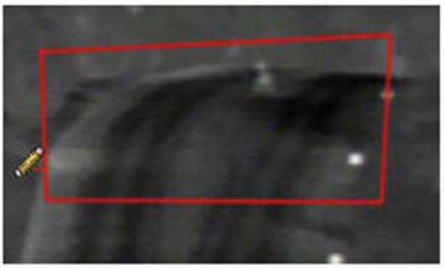
For this example the VMD (Video Motion Detection) is selected. For a description of the different options, please see below.



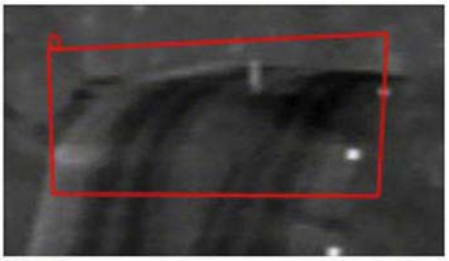
Move the cursor to the next point in the area and click the left mouse button once. A red line appears, marking the first side of the polygon.



Move the cursor to the next point and single click; because the points are now defined a triangle appears.

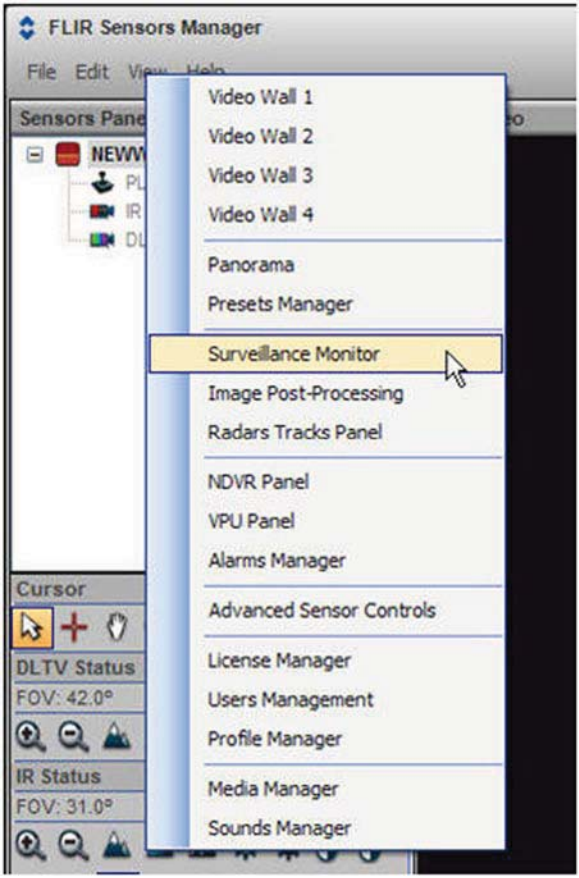


Move the cursor to the last point, in this case the lower left corner of the rectangle shape demonstrated in this example; in this case, double click to complete the area drawing.



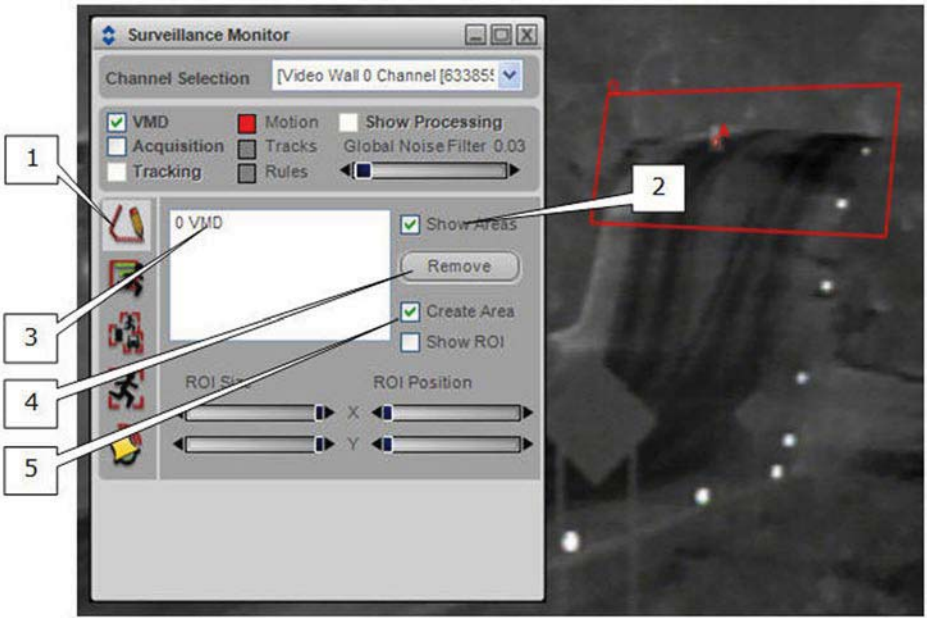
When the user double-clicks to terminate the drawing process, the polygon is complete and an area identifier appears. The first area created is marked with a "0". Subsequent areas that are created are marked with "1", "2", etc.

To delete an area the Surveillance Monitor window will need to be accessed. To do so, click **View** and select the "**Surveillance Monitor**" option:



The Surveillance Monitor window is displayed.

1. Click on the top icon on the left-hand side (the pen icon) to list the existing areas.
2. Make sure the **Show Areas** box is checked).
3. To delete "0 VMD", select it
4. Click the **Remove** button to remove "0 VMD".
5. The user can also enable the **Create Area** checkbox, which turns on the **Edit Area** icon (pen). This is an alternative way to creating an area from within the Surveillance Monitor window, instead of simply clicking on the **Edit Area** icon on the Toolbar.

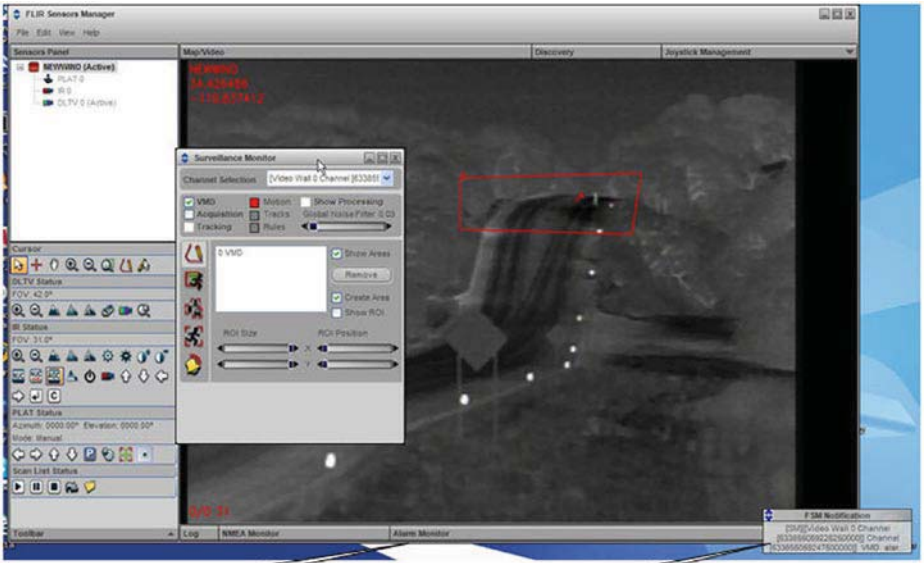


For detailed information on setting up the different parameters for VMD, please refer to section 4 above.

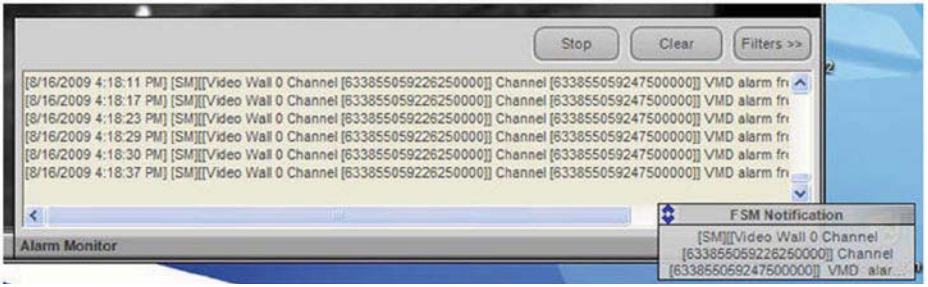
NOTE: Up to 10 areas can be drawn on the displayed video window. Each area can be created using up to 20 vertexes (points in the polygon).

5.2 Alarm Monitoring

If motion is detected within a VMD area, an alarm is triggered. An FSM notification is displayed on the lower right corner of the screen.



Clicking on the **Alarm Monitor** bar displays a list of alarms and associated information for each alarm:



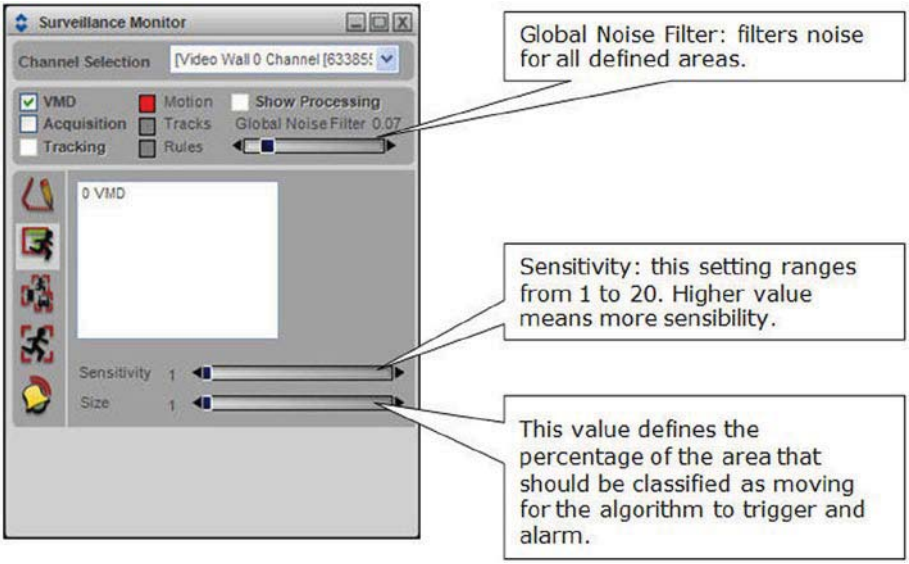
The **Alarm Monitor** has three buttons:

- **Stop**: stops logging alarm notifications. Click **Start** to star again.
- **Clear**: clears list of logged alarm notifications.
- **Filters**: allows the user to restrict alarms generated by a specific server. Alarms can be filtered by server and by string (only the alarms containing the typed string will be listed).

Alarms can be managed using the **Alarms Manager**. For more information see section **5.21 Alarms Manager.**

5.3 Fine Tuning VMD Parameters

Sometimes an alarm is triggered by moving elements that are of no interest. Typical examples are the moving leaves of trees, or the traffic on a distant road. It is possible to adjust the alarm trigger sensitive in order to ignore these false alarms. To achieve this, some parameters like Global Noise Filter, Sensitivity and Size can be adjusted.


Surveillance Monitor
Channel Selection
[Video Wall 0 Channel [633855
VMD
Acquisition
Tracking
Motion
Tracks
Rules
Show Processing
Global Noise Filter 0.07
0 VMD
Sensitivity 1
Size 1
Global Noise Filter: filters noise for all defined areas.
Sensitivity: this setting ranges from 1 to 20. Higher value means more sensibility.
This value defines the percentage of the area that should be classified as moving for the algorithm to trigger and alarm.

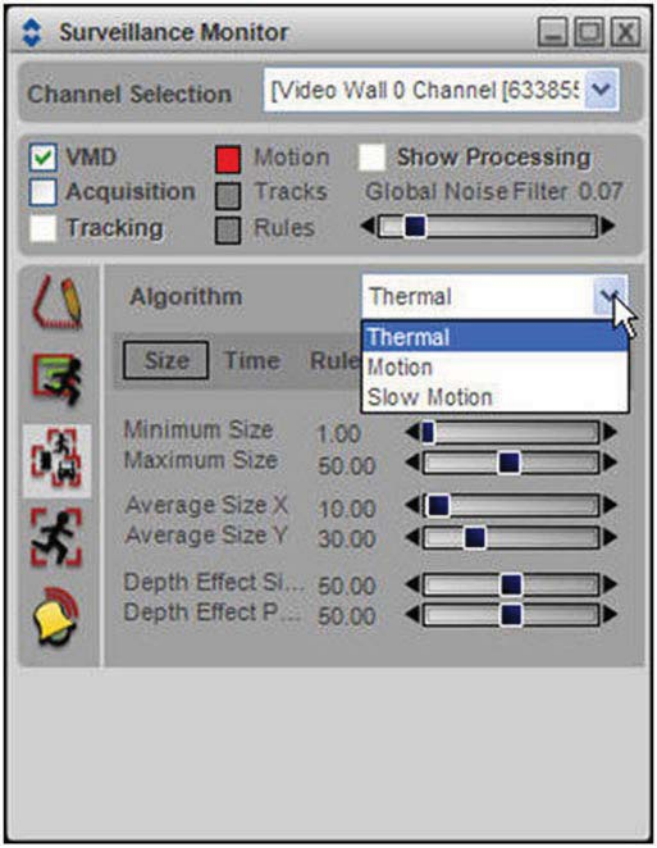
6 Target Acquisition

This is a group of algorithms intended to detect mobile or static targets and tag them with a unique ID. There are three algorithms for Acquisition:

Thermal: Detects and identifies fixed or moving targets marking them with a unique ID tag on video from IR cameras using threshold criteria to detect white (hot) or black (cold) spots.

Motion: Detects and identifies moving targets marking them with a unique ID tag on all kind of video using motion criteria.

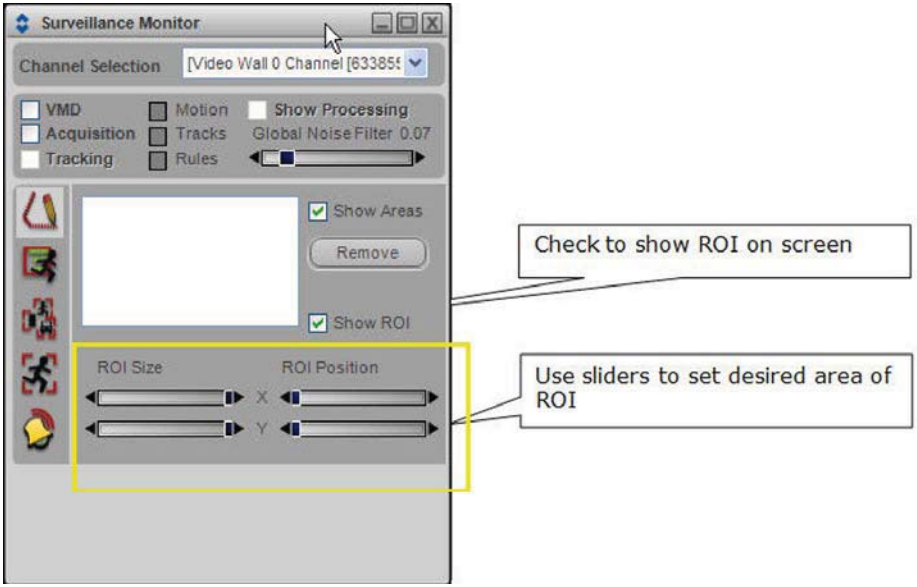
Slow Motion: Detects and identifies moving targets marking them with a unique ID tag on all kind of videos using slow motion criteria (frequently used in maritime environments where the movements of the targets are very slow, like in the case of sailboats in the distance).

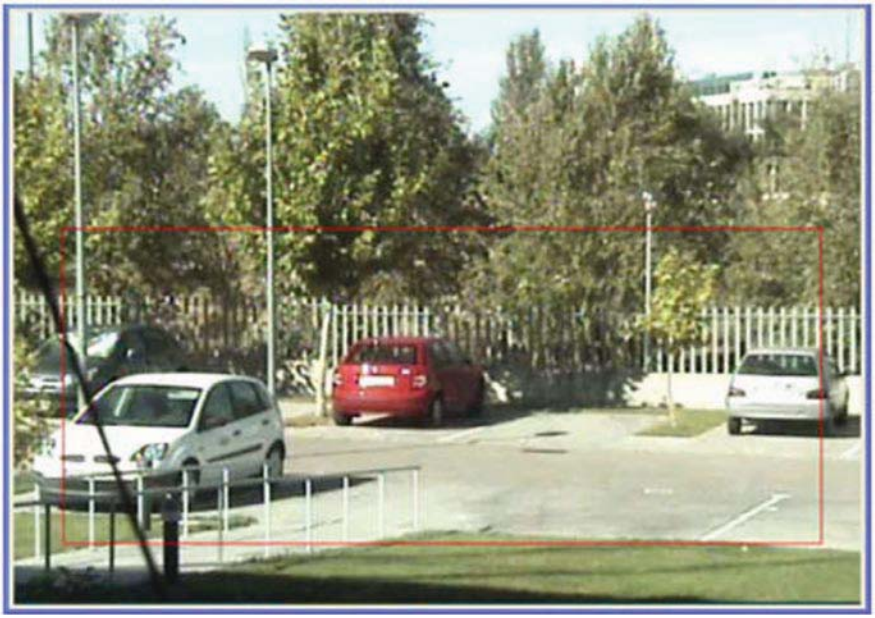


6.1 Setting up a Surveillance System Using the Target Acquisition algorithms

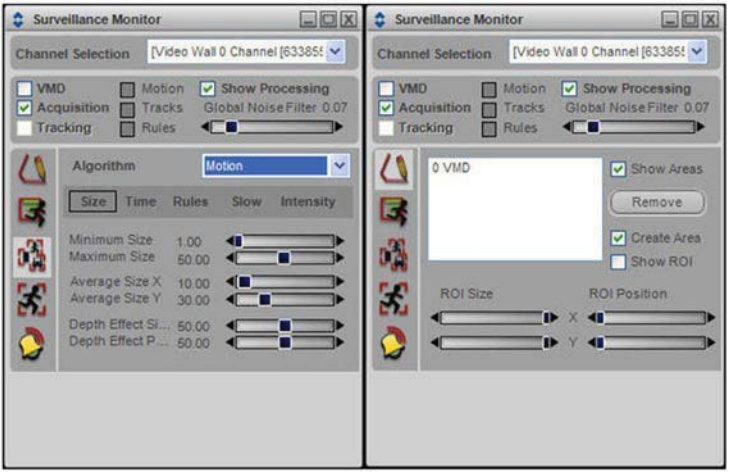
Depending on the source of the video and the motion parameters of targets to be detected, the most appropriate algorithm should be selected. Below is a typical procedure for setting up a surveillance system based on the Motion Target Acquisition algorithm.

Open the Surveillance Monitor and set the ROI. Make sure to enable the **Show ROI** check box to display the ROI on screen:



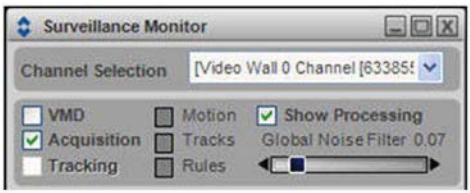


Select the appropriate Target Acquisition algorithm depending on the needs and sensor type (Thermal, Motion, Slow Motion). For this example, the Motion Target algorithm is selected. Enable also the **Show Processing** box:



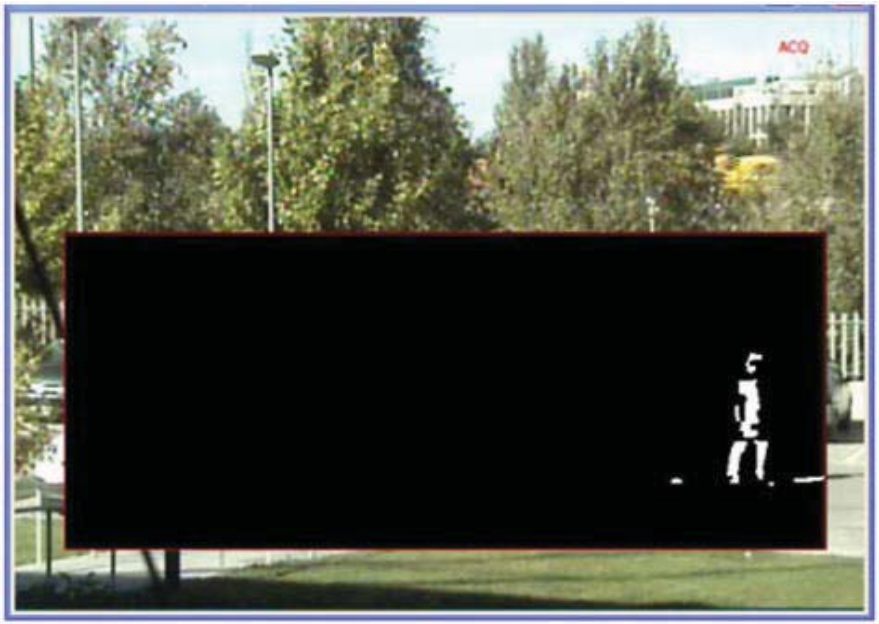
An image similar to this should now display on the video window:

Notice how the algorithm is processing the movements produced inside the ROI. If the algorithm is classifying as motion what is actually background noise (moving leaves) some fine tuning can be done by adjusting the "Global Noise Filter" slider.



6.2 Global Noise Filter Slider

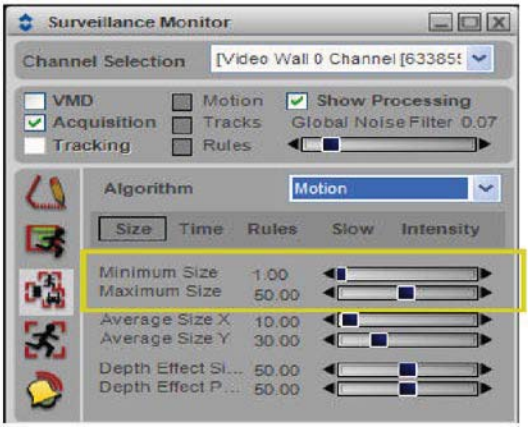
The **Global Noise Filter** slider should be adjusted to discriminate noise between background and the actual targets. More information on the "Global Noise Filter" can be found at section 4 "Important Concepts for VMD". A correct adjustment of this parameter will render results similar to the picture below:



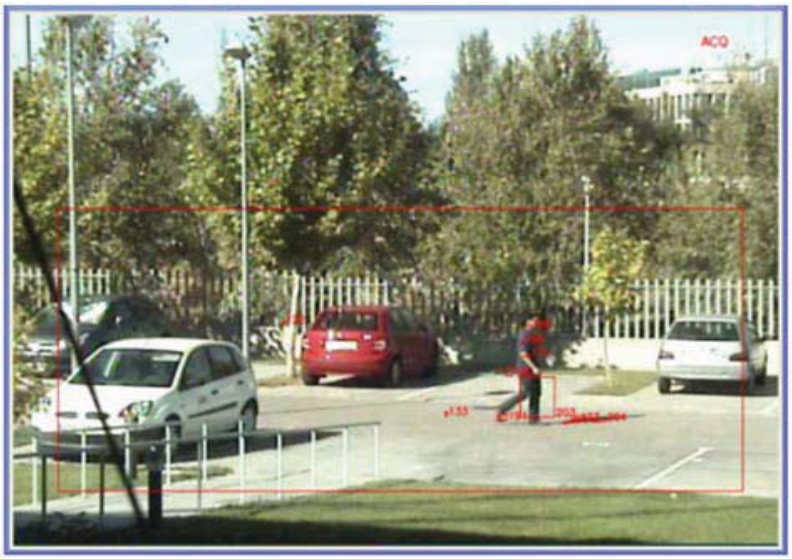
Now, all the movements of the leaves in the trees area have disappeared in the ROI because the Target Acquisition algorithm is rejecting them as statistical noise.

6.3 Min and Max Size

These two values are related to the minimum and maximum size range (in a percentage scheme relative to the total size in pixels of the video image) for the target.



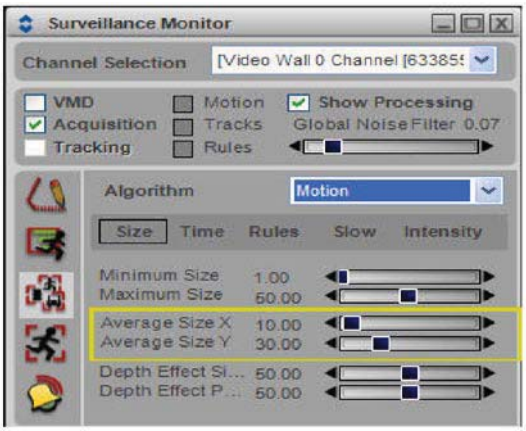
Once these values are set, the **Show Processing** checkbox may be unchecked to see the video normally with the Target Acquisition algorithm running on it.



At this stage there are a lot of targets detected (red boxes with an id number) corresponding to individual parts of the body of the moving subject. Adjustments can be done to unify fragmented targets into one single target (trunk, legs and shadow from a person walking across a parking lot).

6.4 Clustering Target Fragments into a Single Target

The "Average Size" value is related to the size of the target (width and height). The "Depth Effect" value is related to the size and position of the target when this target is located far in the image perspective (background).



As soon as these values are changed, two red squares appear on the video channel window. The one located on the lower left corner of the video corresponds to the "Avg. Size" parameter and the one located above corresponds to the "Depth Eff." parameter. The Avg. Size slider should be set to match the target size (including shadow) on the foreground.

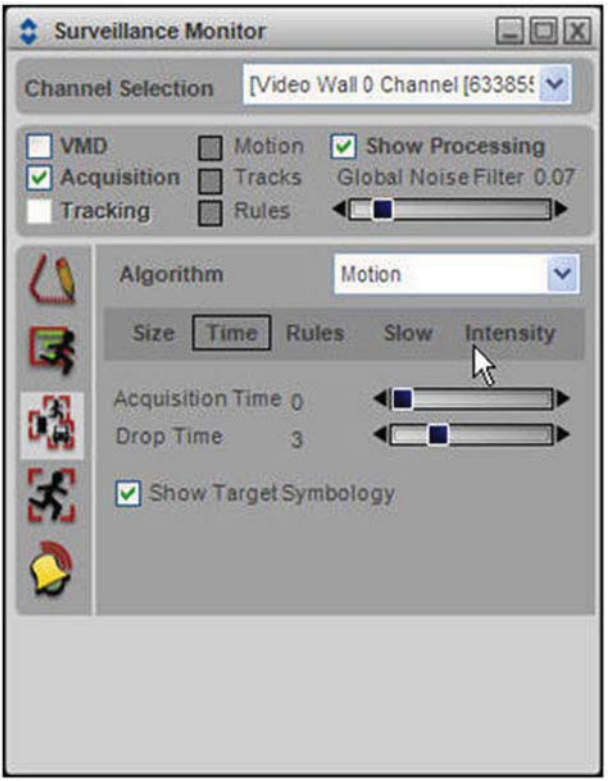
Target clustering in the background is managed with the "Size" and "Pos" sliders in the Depth Effect section. The "Pos" slider selects the position (depth) at which the farthest target may be grouped.

The size sliders set the size percentage of the background target associated with the setting already fixed to the foreground. The rest of values in between foreground and background are just interpolated.

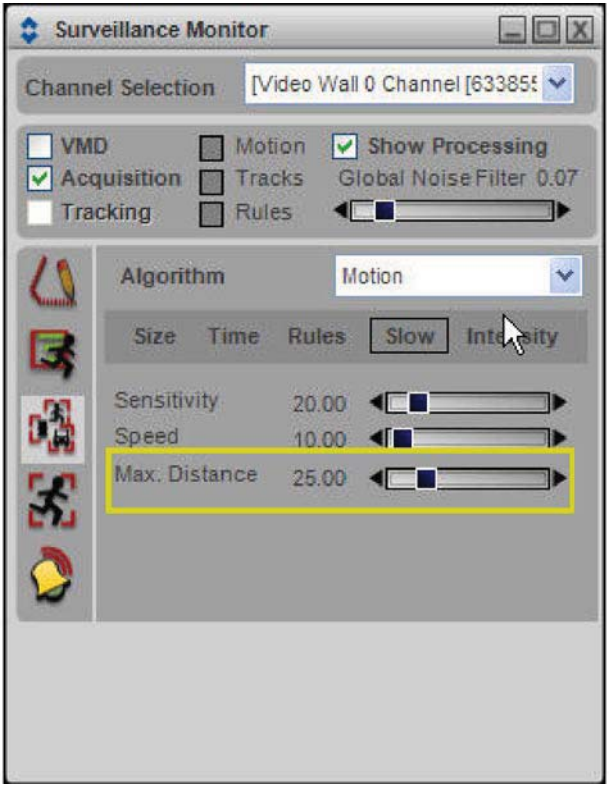
After adjusting these two parameters the Acquisition algorithm is able to process each target as a whole object (including the shadow of the person) as shown in the next image:

6.5 Acquisition and Drop Times

The "**Acquisition**" value relates to the time (in seconds) elapsed between when a target appears in the ROI and when the algorithm marks it as a target. The "**Drop**" value, represents the time (in seconds) elapsed between when a target disappears from the ROI to the moment when the algorithm stops searching for the lost target using predictive trajectory analysis methods.



The "**Max. Distance**" value refers to the statistical distance between targets when predicting motion. This parameter must be set to prevent the algorithm from merging two close moving targets into a single target. Lower values should be set when moving targets are expected to get very close.



7 Profiles

Profiles are used to save all the configuration parameters as well as the ROI, all the defined areas, and all the established rules for a given scene or environmental/lighting conditions.

Settings are saved for both VMD and Target Acquisition algorithms. To create a profile, right click on the video channel window and select "**Save Profile**":

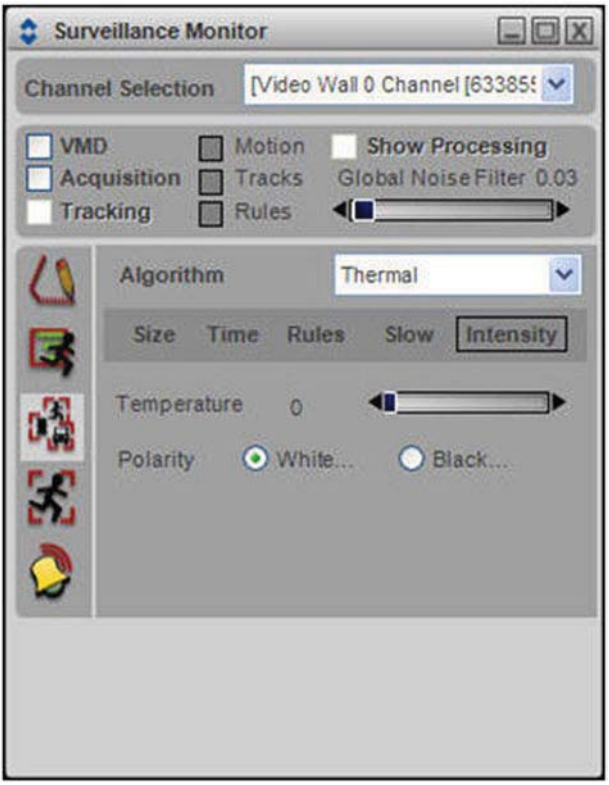
Give a name to the profile and click **Save**.

To load a profile, right –click on the video window and select "**Load Profile**." All the settings loaded in the saved profile are applied.

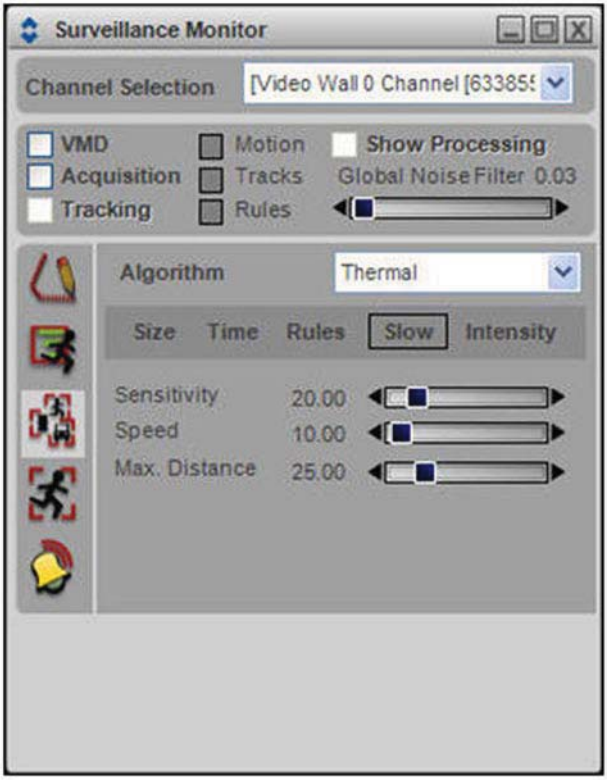
8 Additional Target Acquisition algorithms

Thermal, Motion and Slow Motion Algorithms

The following additional settings help fine tune the thermal, motion and slow motion algorithms and are common to all three. In this example the Thermal algorithm is selected:



Temperature and polarity: The temperature value refers to the thermal intensity of the targets intended for detection. Higher values of this parameter indicate higher thermal intensity of a target. The polarity (White hot or Black hot) refers to the polarity set in the camera configuration.



Sensitivity: Higher values indicate a more sensitive algorithm, thus creating more possible targets.

Speed: The Speed value indicates the expected speed of the targets to be acquired. Higher value indicates the algorithm to look for faster tracks.

9 Summary of VMD and Target Acquisition Settings

		Intelligent Video Algorithms			
Surveillance Monitor Section	**Setting**	**VMD**	**Acq - Thermal**	**Acq - Motion**	**Acq – Slow Motion**
VMD	**Sens**	○			
	Size	○			
	Global Noise Filter	○		○	
Acq - Class	**Temperature**		○		
	Polarity		○		
	Min. Size		○	○	○
	Max. Size		○	○	○
Acq – Size	**Avg. Size**		○	○	○
	Depth Eff.		○	○	○
Times	**Acquisition**		○	○	○
	Drop		○	○	○
Slow	**Sensitivity**				○
	Speed				○
	Max. Distance		○	○	○

APPENDIX E. Shortcuts

SPLASHSCREEN	Ctrl + F	Ignore profile on load
MAIN WINDOW	Ctrl + M	Toggle main menu
ALL WINDOWS	Ctrl + T	Toggle title bar
CURSOR MODES (Map, Video Wall and Panorama windows	A	Arrow cursor mode (no action)
	H	Hand cursor mode (pan)
	R	Reticule cursor mode (aim)
	Z/Shift + Z	Zoom in/out cursor mode (continuous zoom on mouse down, stop on mouse up for the video)
VIDEO WALL	Ctrl + F	Mouse double-click: full screen
	Esc	Exit full screen
MAP	Mouse Wheel	Zoom in/zoom out
	Ctrl + mouse wheel	Pan horizontal
	Shift + mouse wheel	Pan vertically
	Alt+Mouse Wheel or Ctrl+R	Rotate map right
	Alt+Mouse Wheel or Ctrl+Shift+R	Rotate map left
	Ctrl+N	Reset rotation
	B/ Shift+B	Map opacity
PANORAMA	Mouse double click	Aim (regardless of the cursor mode)

GLOSSARY

Acquisition	Function carried out by a group of algorithms intended to detect mobile or static targets and tag them with a unique ID.
AGC	Automatic Gain Control (AGC) allows for a clear video output, despite variations in the signal obtained by the sensor. Weaker signals receive more gain; stronger signals receive less gain or none at all, depending on parameters set.
Blanking	An area on the video image within which the acquisition engine is disabled. Useful when it is necessary to exclude certain areas in the image from triggering false alarms.
BMP	The BMP file format, sometimes called bitmap, is an image file format used to store bitmap digital images.
CIF	CIF (Common Intermediate Format), also known as FCIF (Full Common Intermediate Format), is a format used to standardize the horizontal and vertical resolutions in pixels of YCbCr sequences in video signals.
DLTV	Daylight TV. It refers to the daylight, or standard video camera sensor.
eStab	Electronic Stabilization. This function utilizes an algorithm to stabilize shaky images caused by movement or vibration of the sensor, as might be the case when the camera is mounted on a high pole or a vehicle.
FOV	Horizontal Field of View of the camera.
FPA	Focal-plane array is an image sensing device consisting of an array (typically rectangular) of light-sensing pixels at the focal plane of a lens.
FPS	Frames per Second. This relates to the frame rate, or frame frequency, which is the measurement of the frequency (rate) at which an imaging device produces unique consecutive images called frames. Frame rate is most often expressed in frames per second (FPS) and in progressive-scan monitors as hertz (Hz).
FSM	FLIR Sensors Manager.
Geo-location	Geo-location is the identification of the real-world geographic location (Lat/Long) of a given object.

GIS	A geographic information system (GIS) captures, stores, analyzes, manages, and presents data that is linked to location. GIS refers to any geographic information systems which includes mapping software and its application with remote sensing, land surveying, aerial photography, mathematics, photogrammetry, geography, and tools that can be implemented with GIS software.
GPS	The Global Positioning System (GPS) is a U.S. space-based global navigation satellite system that provides reliable positioning, navigation, and timing services to worldwide users. GPS satellites broadcast signals from space that are used by GPS receivers to provide three-dimensional location (latitude, longitude, and altitude) plus the time.
I/O	Input/Output. Typically refers to an I/O sensor that gets input signals and allows enabling devices connected to its outputs.
IR	Infrared. It refers to the infrared sensor.
JPG	Short for Joint Photographic Experts Group. JPG is one of the image file formats supported by FSM.
Leveling	Calibration process done when a server is not installed over a horizontal surface.
Longitudinal Error	One of the parameters of the leveling. It is the sensor rotation in the longitudinal (front-to-rear) axis.
LRF	Laser Rangefinder. A laser rangefinder is a device which uses a laser beam to determine the distance to a reflective object.
MP3	MPEG-1 Audio Layer 3 (MP3) is a digital audio encoding format using a form of data compression. It is a common audio format for consumer audio storage, as well as a de facto standard of digital audio compression for the transfer and playback of music on digital audio players.
MPEG	Moving Picture Experts Group; the term refers to the family of digital video compression standards and file formats commonly used. MPEG algorithms compress data to form small bits that can be easily transmitted and then decompressed.

NDVR	Network Digital Video Recorder is a fail-safe storage solution that offers continuous recording of up to 25 simultaneous MPEG network video streams from Nexus sensors directly to digital indexed storage.
NMEA	Combined electrical and data specification for communication between electronic devices such as echo sounder, sonar, anemometer (wind speed and direction), gyrocompass, autopilot, GPS receivers and many other types of instruments. It has been defined by, and is controlled by, the U.S.-based National Marine Electronics Association (NMEA).
NUC	Non-Uniformity Calibration. FPA Calibration process in IR sensors.
OSD	On Screen Display. Graphic information that can be overlaid over the video image to provide timestamp, sensor name, sensor geo-location, azimuth/elevation, field of view, and head-up display.
PLAT	(Platform) Pan and Tilt. A device that allows changing the orientation of the sensor.
POV	Point of View. In Joysticks, it refers to a hat-like device on top of the joystick that resembles a small joystick with a fixed number of positions.
PT	Pan and Tilt also called PLAT.
ROI	Region of Interest. Refers to a user-selectable area of the image that requires particular attention. The ROI also creates an area where video post-processing algorithms and image filters are applied.
SDK	The Software Developers Kit (SDK) is a tool that helps systems integrators to deploy FLIR Systems thermal imaging cameras in large, existing or new, security networks. The SDK is designed to accelerate any application programming with FLIR Systems thermal imaging cameras. The SDK toolkit allows for "plug & play" installation of FLIR Systems thermal imaging cameras in TCP/IP infrastructures.
Transversal error	One of the parameters of the leveling. It is the sensor rotation in the transversal (left-to-right) axis.

VMD	Video Motion Detection. It consists on an algorithm that is able to detect motion inside predefined "VMD" or "VMD & Track" areas in the video channel. When motion is detected inside any of these predefined areas, a VMD alarm is triggered.
VPP	Video Post Processing. The post-processing module allows managing the detection algorithms, the image filters, and the electronic stabilization.
WAV	WAV (or WAVE), short for Waveform audio format, also known as Audio for Windows, is a Microsoft and IBM audio file format standard for storing audio files on PCs.
Wire	An open, multi-segment line over which the rules engine algorithm is active. Can be set like a video "trip wire" drawn across an image to trip alarms.

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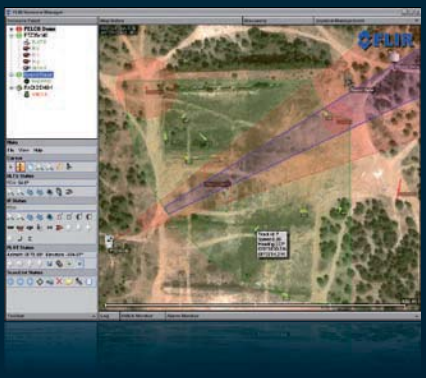

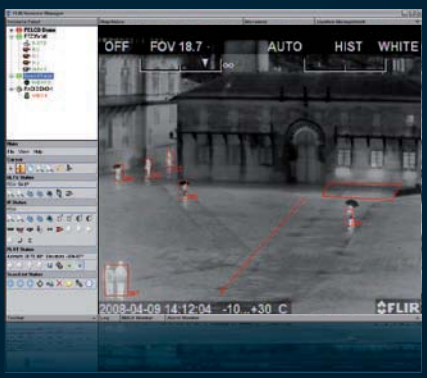

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